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THESIS

OPERATIONS AND MAINTENANCE COSTS FOR NEW
MAJOR U.S. COAST GUARD PLATFORMS:
PROJECTED VERSUS ACTUAL COSTS

by

John Ewen Frost

June 1989

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MAJOR U.S. COAST GUARD PLATFORMS:
PROJECTED VERSUS ACTUAL COSTS

by

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Lieutenant, United States Coast Guard
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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

This thesis examines the accuracy of the operations and maintenance budget models developed for new U.S. Coast Guard cutters and aircraft as part of life cycle cost analysis prior to acquisition. The HU-25A medium range search aircraft and HH-65A short range recovery aircraft were used along with the 270 foot medium endurance cutter and the 110 foot patrol boat. A regression method of estimating these costs using historical costs was explored as an alternative to the laborious task of identifying each major cost element. The results indicated that the budget models are poor predictors and that parametric methods may provide more accuracy. Additional research in developing cost estimating relationships for this purpose is needed.

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I. INTRODUCTION

A. OVERVIEW

The United States Coast Guard is by far the smallest of the nation's armed forces, with a total active duty strength of about 28,000 and an annual budget of \$3.43 billion, as requested for fiscal year 1990 (H.R. Doc No 101-4, 1989, p.I-R33). The Coast Guard has never been a "big ticket item" in the federal budget. It has repeatedly had to fight for its survival since its creation in 1790. Over the years it has learned to make do with used equipment, ships, and shore facilities and has worked to get the most out of every dollar appropriated. Frequently, when the federal government has faced austere financial situations, the Coast Guard has been among those agencies considered for civilianization, dismemberment to other agencies, or total elimination. Often what has saved the service is its ability to stretch a dollar over more missions than anyone else. Indeed, this is a part of the service's continuing budget strategy, called the multi-mission concept (Bragaw, 1980, p.6).

The present federal deficit reduction mood in the executive and legislative branches once again poses a challenge to the Coast Guard's existence. Efficiency and effectiveness will continue to be the keys to budgetary survival. The

lion's share of the Coast Guard's total funding in a given fiscal year comes from the Operating Expenses Appropriation. It is from this appropriation that the basic necessities of operations are paid. Operations and maintenance (O & M) costs for all the aircraft, cutters, and boats (collectively referred to as platforms) used by the service are paid out of the Operating Expenses (OE) Appropriation. While these costs can be reduced to some degree during federal budget crunches, doing so over a prolonged period of time can permanently affect how those platforms perform. Platform life can be shorted through too little maintenance. Crew safety can be adversely affected. Needed on the job training and experience will decrease. For these reasons and others, the Coast Guard looks to acquire platforms that will keep O & M costs low.

Evaluation of O & M costs for new platforms is part of the life cycle cost analysis done during the initial acquisition planning phase. When several new platforms are being considered to fill a mission need, their acquisition costs can often be very similar. How much they will cost to operate over a 20 to 30 year operating life or longer can be the deciding factor in choosing the platform to be procured. The accuracy of the life cycle cost estimates is obviously crucial.

B. RESEARCH OBJECTIVES AND QUESTIONS

The objectives of this thesis are to review the accuracy of Coast Guard O & M cost estimation for new platforms and to attempt to apply parametric (regression) methods to that process. Because these estimates affect acquisition decisions as well as the structure of the OE and Acquisition, Construction, & Improvements (AC&I) appropriation requests for many years into the future, their accuracy in the foreseeable tight budget climate is very important. Examination of an alternative estimation method may identify a more effective way of attaining accurate estimates and facilitate informed decision making. The two primary research questions that guided this thesis were as follows:

- How well do the Operations and Maintenance budget models developed as part of the life cycle cost analysis for a new platform predict actual O & M costs?
- Can parametric methods of estimation be developed to predict O & M costs better?

These questions lead to several secondary questions which were:

- Are there significant variations between the O & M budget model predictions and actual O & M costs?
- What cost areas showed these variations?
- What caused the variations?
- Could the budget model have made better predictions?
- What variables are used in the budget model to predict costs?
- Are there better predictor variables that can be used in a regression generated budget model?

C. SCOPE, ASSUMPTIONS, AND LIMITATIONS

The budget models for platforms recently acquired by the Coast Guard were examined in order to answer the research questions. These acquisitions were chosen because they are most likely to reflect current methods of analysis as well as current budget procedures. Also, the required planning and budget documents as well as cost data would still be easily obtainable.

To better illustrate the estimating ability presently available, emphasis was placed on the O & M cost estimations done prior to acceptance of the platform for operations. Estimates made after platforms commenced operations would have the advantage of actual service-generated operating data for use in making revisions. Also, once an operating budget base is developed for a platform, incremental budgeting becomes the common practice instead of using budget models.

Two aircraft and two cutter procurements which have occurred since 1979 were selected for analysis. The aircraft programs used were the Medium Range Search (MRS) aircraft and the Short Range Recovery (SRR) aircraft. The cutter programs used were for Medium Endurance Cutters (WMEC) and Patrol Boats (WPB). A brief program background for each platform is provided later.

Several assumptions have been made to conduct this analysis. The programs chosen are assumed to be typical of the major acquisitions process used by the service. Budget

models were accepted as they were presented in the documentation reviewed. Their formulation was not questioned. Costs were assumed to be accurately charged to the appropriate platform type and the correct operating guide. These assumptions are reasonable and facilitated the analysis.

Some limitations were encountered in this research. Complete cost data were not available for each platform for every year of operation. Making statistical inferences from small samples is more difficult than from larger ones because there is more of a possibility of error. Appropriate statistical methods were used in the analysis of small samples. Still, the sample size could limit the reliability of some of the statistical analysis, particularly for the SRR and WFE programs, where only three years of actual cost data were available.

Another limitation encountered was the amount of documentation available for platform budget models. Some documents were very complete, showing all assumptions and calculations, while others only indicated total amounts. This made understanding the construction of the budget models impossible. None of the individuals who formulated these models is still in place and only one could be contacted for information. While this prevented any analysis of budget model generation, it did not hinder the analysis.

D. PLATFORM HISTORIES

The MRS program was developed to obtain a replacement aircraft for the HU-16E Albatross or "Goat", as it was affectionately called. The HU-16E was a small, amphibious, twin propeller, fixed wing aircraft used for search and rescue, law enforcement, and pollution patrols of four to six hours, though the aircraft was capable of longer missions. It was becoming a maintenance problem as well as a health hazard (noise) for the air crews. The aircraft to replace the HU-16E was to be selected from "off the shelf" aviation technology for ease in obtaining spare parts from commercial sources. A French-built corporate jet called a Guardian was selected as the replacement and was designated the HU-25A. In order to meet federal procurement standards, as well as obtain better efficiency while operating at low altitudes, an American-built engine was selected to be used in place of the engines already installed. Computerized, state of the art avionics were also a major requirement to reduce flight deck work loads and permit more attention to conduct of the mission.

The SRR program was started to replace the HH-52A Sea Guard helicopter which was used by the Coast Guard since the early 1960's. The HH-52A was a small, single turbine, amphibious helicopter that was the work horse of the service's aircraft for over 20 years. It was simple enough to be operated by a crew of two during daylight and was deploy-

able aboard air-capable cutters. It had a maximum endurance of about two and a half hours, which made it ideal for coastal search and rescue as well as law enforcement operations. The airframe was getting old, as was the avionics package. The replacement aircraft was to take maximum advantage of the latest in avionics in order to reduce the pilot work load and so, improve visual search results. Also, twin engine reliability was sought. The chosen replacement was a French-built helicopter used by both industry and some European armed forces. It was designated the HH-65A and has a crew of three. It was to be equipped with American-built engines and avionics for reasons similar to those in the HU-25A procurement.

In the late 1970's many of the Coast Guard's fleet of larger cutters were well past the normal life expectancy of a military vessel. A group of High Endurance Cutters (WHEC)¹ of the 327 foot class had been in continuous commission since the late 1930's.² For operations and budget reasons, a class of 270 foot Medium Endurance Cutters (WMEC) was selected as their replacement. A WHEC is capable of four to six weeks sustained operations without replenishment while a WMEC is capable of two to three weeks sustained operations. The 270 WMEC is designed to make maximum use of shipboard automation

¹ The "W" indicates a Coast Guard vessel.

² Coast Guard cutter and boat classes are referred to by their length. For example, the 327 WHEC class was 327 feet long.

technology and controls to reduce required manning levels on the bridge, in the Combat Information Center (CIC) and in the engine room. The cutter is twin screw, diesel powered and equipped with a 76 millimeter Mark 75 rapid fire gun and Mark 92 fire control system, a computerized bridge, and a flight deck certified for operation of the HH-65A or the U.S. Navy Light Airborne Multi-Purpose (LAMPS) helicopter. It carries a crew of 100.

The fleet of 92 patrol boats (WPB), of 82 foot and 95 foot lengths, are the Coast Guard's front line resource in coastal law enforcement and search and rescue. The 95 WPB's were commissioned in the mid-1950's while the 82 WPB's were commissioned in the early 1960's. Both classes had seen much work and were to be replaced in the late 1980's. In the mid 70's the 95 WPB's were to undergo a shipyard rehabilitation to help them meet their service life. Unfortunately, many of them were found to be unrepairable for numerous reasons, the primary of which was normal wear. At this same time, drug interdiction operations in the Caribbean region were increasing and the WPB's were a primary resource in those operations. A replacement patrol boat was needed immediately to fill the void. A proven patrol boat design from Vosper-Thornycroft was purchased and modified slightly for Coast Guard use. The 110 foot cutters were built in the U.S. and purchased in one of the fastest acquisition programs ever conducted by the service. The cutter is a twin screw, diesel

powered, steel hulled boat, armed with a single 20 millimeter machine gun and two 50 caliber machine guns. They are operated by a crew of 16 with an endurance of five days without replenishment. They are intended as a short term solution, for 10 to 15 years, until a more durable and efficient patrol boat can be procured.

E. THESIS ORGANIZATION AND ABBREVIATIONS

The following chapter will describe in more detail general budget theory and the budget preparation procedures used for the Coast Guard. Chapter III outlines the methodology used to explore and analyze the research questions. Data analysis is contained in Chapter IV and is followed by conclusions and recommendations Chapter V. The appendices contain inflation rate information, copies of all research data obtained, and the computer output for all regressions run.

The following abbreviations are used throughout the text and are provided as an aid to the reader.

AC&I	Acquisition, Construction, and Improvements Appropriation
CER	Cost Estimating Relationship
CGHQ	Coast Guard Headquarters
DoD	Department of Defense
DoT	Department of Transportation
FY	Fiscal Year
LCC	Life Cycle Cost

OE	Operating Expense Appropriation
OG	Operating Guide
OG-30	Operating and Maintenance Costs account
OG-41	Aircraft Program account
OG-42	Electronics Program account
OG-45	Vessel Program account
O & M	Operations and Maintenance
RCP	Resource Change Proposal
WHEC	High Endurance Cutter
WMEC	Medium Endurance Cutter
WPB	Patrol Boat

II. BUDGET THEORY AND THE COAST GUARD BUDGET PROCESS

An understanding of budget basics and how the Coast Guard uses budgets in capital acquisitions is necessary before analysis can begin. This chapter outlines budget theory and the Coast Guard budget process.

A. BUDGET THEORY

Budgets are used by organizations to express their operating plans in a quantitative way (DeCoster, Schafer, & Ziebell, 1988, pp.12-13). They are developed in detail at lower levels of the organization and aggregated as they are forwarded to higher level decision makers. Budget projections are usually for one year in the future but any period can be used. When approved they represent management's acceptance of responsibility for attaining the budgeted objectives. The approved budget document becomes a control tool for management to measure and evaluate operating performance.

There are several different types of budgets used. Expense budgets deal strictly with a planned level of spending for a planned level of activity. Revenue or sales budgets express target levels of revenue generation. Profit budgets combine both revenues and expenses to express target

levels of profit. While the private sector uses all three types of budgets, most government agencies use only expense budgets, since no profit is expected. (Anthony, Dearden, & Bedford, 1984, pp.443-446)

In preparing an expense budget an economic analysis is conducted, based on management's planned operating programs and anticipated activity level, to develop cost estimates. The estimates will then be used to create a budget model that reflects the expenses associated with different levels of operation. Cost estimation can be accomplished in several ways, but direct cost estimation and parametric cost estimation are the methods used most often. Direct cost estimation involves a complete review of operations and estimation of each cost element associated with each program at a projected level of activity. Direct cost estimation includes all relevant costs, both direct and indirect, as those terms are conventionally used in cost analysis and accounting. Parametric methods use statistically developed equations from historical data to predict future costs at the planned operating level.

"Direct cost estimating involves meticulous penetration into the smallest feasible portions of a work activity and the systematic and methodical assembly" of all cost elements (Stewart & Wyskida, 1987, p.224). When this is done, the results are combined in a flexible budget model which expresses estimates in terms of fixed costs that are insensi-

tive to activity level and variable costs that change with activity level. This technique is common in organizations today. Because of the detail involved in direct cost estimating, only limited analysis of different operating variables' effects on expenses (sensitivity analysis) is realistically possible.

Parametric estimating is becoming more widely used. As noted previously, it uses statistical methods and historical data to develop a budget model which relates cost to physical and/or performance variables associated with the project or program being estimated. The model, made up of equations called Cost Estimating Relationships (CER's), can be developed quickly by using computers and computer data bases. The advantages of using CER's for cost estimation are computer speed and accuracy, the use of less detailed information, and the ability to do extensive sensitivity analysis to determine the effects of different operating variables.

Private sector organizations frequently use direct cost estimation in developing their flexible budget models. Those budgets models then stay much the same from year to year, except when significant changes in operating methods or prices require the budget model to be adjusted. Government agencies often make only incremental changes in their budget requests to reflect higher price levels, with little adjustment of basic budget models for changes in operating methods or activity levels. Observation of Coast Guard procedure

shows budget models are created but frequently are abandoned for the incremental approach, probably because of the political uncertainty of the government budget climate.

Budget models are used in analyses of investment projects such as capital acquisitions. When an organization is evaluating several projects for investment, decision makers often use techniques such as net present values, profitability indexes, and internal rates of return as bases for comparison. These techniques all require estimation of the cash flows associated with each project. This means that the revenues expected from the project over its entire economic life (life cycle revenues) and the costs of the project over its entire life (life cycle costs) must be estimated. Part of the life cycle cost estimation involves development of an operating budget to predict the operating costs.

Accurate estimation of operating costs from the budget created for a project can have a major impact on acceptance or rejection. This is particularly true when initial acquisition costs, disposal costs, and the lives of several projects being considered are close to each other. Both private and government organizations frequently use direct cost estimation to develop life cycle costs for projects.

The Coast Guard uses direct cost estimation for development of flexible budgets contained in the Resource Change Proposals (RCP's) for projects under consideration. Paramet-

ric methods for life cycle cost development have not been used by the Coast Guard. (U.S. Coast Guard, Planning and Programming Manual, 1983, p.3-3)

B. THE COAST GUARD BUDGET PROCESS

To understand the importance of budgets, particularly operations and maintenance budgets in the Coast Guard, a familiarity with the budget process is necessary. This section outlines the system as described by the **Planning and Programming Manual**, Commandant Instruction M16010.1A.

The Coast Guard uses the Planning, Programming and Budgeting System (PPBS) as its process

to determine objectives, to develop and select programs for achieving them, and finally to allocate resources among these programs in a cost effective manner. . . . In sharp contrast to many traditional approaches PPBS focuses primarily on outputs. High level policy is made before budget assembly commences and the resulting budget is a statement of policy, i.e., a statement of what is to be accomplished with the resources. (U.S. Coast Guard, Planning and Programming Manual, 1983, p.1-1)

This means that the concentration is on the objectives of the Coast Guard (i.e., Search and Rescue, Enforcement of Laws and Treaties, Marine Inspection, etc.) instead of operating responsibilities like cutters, boats or aircraft. (U.S. Coast Guard, Planning and Programming Manual, 1983, Ch 1)

1. Planning

Overall management responsibility for an approved program rests with the Commandant of the Coast Guard. The Commandant, an admiral responsible to the Secretary of Transportation, provides basic policy guidance through a

document called the Long Range View (LRV), which projects Coast Guard roles, missions, program needs and the expected operating environment for the next 15 years.

The Chief of Staff, the senior rear admiral in the service, is the focal point of policy and programming review. The Chief of Staff is responsible to the Commandant for the coordination of the various Program Directors, ensuring that policy is followed and prioritizing program items for inclusion in the Forecast Stage Budget being prepared for submission to DoT.

Program Directors are CGHQ office chiefs, rear admirals, responsible for "accomplishment of program objectives through short and long range planning, programming, and use of personnel and material" (U.S. Coast Guard, Planning and Programming Manual, 1983, p.2-1). They may direct more than one program. For example, the Chief, Office of Navigation is the Program Director for these programs: Short Range Aids to Navigation, Radionavigation Aids, Bridge Administration, Waterways Management, Search and Rescue, and Ice Operations.

Programs are the means for achieving Coast Guard objectives and are divided into two types, Operating Programs and Support Programs. Operating Programs like Search and Rescue directly serve the public. Support Programs primarily support other Coast Guard programs. For example, Engineering supports Enforcement of Laws and Treaties.

Program Managers are captains who are charged with supporting their Program Director by continuously reviewing and implementing routine program policy, preparing policy proposals, and working out details in planning, programming, budgeting and budget execution for a specific program.

In meeting the responsibilities of his assignment, each Operating and Support Program Director/Manager is expected to:

- a. Manage with a clear objective consistently in the forefront.
- b. Develop and use a five year Program Plan which translates formal Coast Guard objectives into programs using measurable program benefit or output measures of effectiveness to match against costs.
- c. Identify policies under which the program is carried out (alternative policies permit alternative hardware, or mixes thereof).
- d. Perform studies of the impact of future changes in demand, policy, criteria and technology.
- e. Develop feasible alternatives and propose necessary legislation.
- f. Develop an appropriate data base (management information) for managing and evaluating the execution of the program.
- g. Review and/or develop program resource change proposals (RCP) and budgets and identify priorities for rapid dollar-level adjustments (e.g., for RDT&E, AC&I, OE).¹
- h. Request, identify and give direction for major support requirements (e.g., personnel, engineering, comptroller, R&D).
- i. Provide program guidance to the field. (U.S. Coast Guard, Planning and Programming Manual, 1983, p.2-2)

The Operating and Support Managers use the LRV as guidance in producing their five year, output oriented Program Plans. From these plans Facility Requirements are generated to document the need for boats, aircraft, cutters,

¹ Research, Development, Test & Evaluation; Acquisition, Construction & Improvements; and Operating Expenses appropriations.

and command, control and communications that were identified in the Operations Program Plans or Support Program Plans. The Facility Requirements are then compiled and prioritized in the Capital Investment Projection (CIP).

In addition to headquarters identified needs, field units may also submit requirements for inclusion in budget planning. These requirements are usually included in one of several forms such as a Planning Proposals, Comprehensive Proposals, and AC&I Project Proposals.

2. Programming

The first step of the programming phase of budget formulation is called Determinations. In this phase, Program Directors conduct a dialogue with the Commandant and Vice Commandant through the Chief of Staff and obtain an understanding of the goals and objectives which are to receive emphasis during preparation of the Forecast Stage Budget. The Commandant is directly accessible to the Program Directors during this step and provides personal responses with specific policy guidance.

Once the Determinations have been made, Program Directors have Resource Change Proposals (RCP's) prepared by the Program Managers to request changes in resources for the current or a future budget year. Acquisition and operating budgets are developed in the RCP to identify the accounts impacted by the change and the estimated costs.

Using RCP's, the resource allocation process takes into account the decisions and directions provided during Determinations. RCP's normally evolve from Program Plans, Planning Proposals, Comprehensive Proposals, ...AC&I Project Proposals, and the Capital Investment Projections. The RCP itself discusses the problem thoroughly and includes up to four alternatives together with the cost of each over a five year period.² All increases and decreases in resources required by the proposed change are also discussed. RCP's are initially analyzed and ranked in a draft RCP list by the Chief, Programs Division (G-CPA).³ (U.S. Coast Guard, Planning and Programming Manual, 1983, p.3-3)

The initial ranked list of RCP's then goes to the Coordination Board chaired by the Deputy Chief of Staff, a captain. The Board is made up of all operations and support program managers as well as the deputy office chief from each office in CGHQ. The Board reviews the draft prioritized RCP list and decides on changes in ranking and deletion. The results of their review are presented to the Chief of Staff for review and approval. The Chief of Staff then presents the package to the Commandant for final approval.

3. Budgeting

Once the Commandant has approved the RCP list, it is sent to Budget Division (G-CBU) to be fully priced. Working with G-CPA, G-CBU turns the RCP listing into proposed appropriation legislation to be presented to the Secretary of Transportation, OMB, and eventually Congress. There are several appropriations which cover certain types of ac-

² Costs are broken out by funding account in the RCP.

³ Programs Division is under the Office of the Chief of Staff.

tivities and expenses. For example the Operating Expense (OE) appropriation includes all operating costs such as fuel, maintenance, pay, leases, ammunition, etc. Other appropriations include Acquisition, Construction and Improvements (AC&I); Alteration of Bridges (BA); Reserve Training (RT); Research, Development, Test and Evaluation (RDT&E); Retired Pay (RP); and others.

When Congress has enacted appropriations and OMB and DoT have apportioned the funds, G-CBU translates the appropriations into dollar amounts in various Operating Guides (OG), the numbered accounts that fund specific types of activities. They then monitor account levels during budget execution to detect potential problems and identify reprogramming needs.

Operations and maintenance costs all fall under the OE appropriation. The following OG's are the O & M related funds under the OE appropriation to be analyzed in this thesis and are described in Figure 1.

Operating Guide	Title	Description
OG-30	Operating and Maintenance Costs	General housekeeping, repairs and maintenance, office supplies, utility services, leases, TAD expenses, minor equipment procurement, medical supplies, ammunition, fuel, etc.
OG-41	Aviation Program	Repairs, maintenance and modification to aircraft engines, airframes, electrical systems, hydraulic systems, survival systems, test equipment, and supplies, etc.
OG-42	Electronics Program	All electronic and some types of avionic maintenance and modification.
OG-45	Vessel Program	Maintenance, repair and modification of vessels, including main propulsion, generators, and other installed systems.

FIGURE 1 OPERATING GUIDES

III. METHOD OF ANALYSIS

Analysis was conducted on four different major acquisition projects, two vessel classes and two aircraft models. Three basic types of information were needed: the Operations and Maintenance budget models for each project, the actual operating activity for each platform, and the actual O & M expenses for each platform. This information was provided by mail and through personal contact with several offices in Coast Guard Headquarters (CGHQ).

Budget models for OG-30, OG-41, OG-42, and OG-45 were extracted from the Resource Change Proposals (RCP's) on file with the responsible facility manager. Cutter RCP's were obtained from Cutter Division (G-OCU) and aircraft RCP's from Aviation Division (G-OAV) in the Office of Law Enforcement and Defense Operations (G-O), CGHQ. Each cutter and air station reports its operating activity quarterly in an Abstract of Operations Report which is filed in the Plans and Programs Division (G-OP) of G-O. G-OP provided summary reports by cutter and aircraft and by Fiscal Year (FY). Actual expenses were obtained in a summary by cutter class, aircraft model, Operating Guide (OG) and FY from Accounting Division (G-CAC) in the Office of the Chief of Staff (G-CCS).

Several years' worth of RCP's were reviewed for each project from the time the project was started or as far back as records were found to the RCP prepared during the FY in which the first platform became operational. This review was done to insure that no actual operating information could have been used to modify the O & M budget models considered. Each year's RCP had adjustments for inflation and in some cases changes in the cost relationships in the budget model. The model selected was the one that held the most recent change in cost relationships, since the intent of the research was to determine how well costs could be predicted without specific operating information. Actual costs were then adjusted to current dollars of the budget model's FY for analysis.

The accuracy of a budget model rests in the relationship of activity or other variables to expenses. If the model does not accurately capture this relationship, it can not provide meaningful cost projections. On the other hand, if the cost-activity relationship is accurate the model should be very useful.

A standard was needed to measure the accuracy of budget model predictions. Five percent of budget projection was chosen for the standard. If actual costs are within plus or minus 5 percent of the budget model's projection for the actual activity level, then the model is considered to provide reliable information. This standard was chosen as a

practical margin for error after reviewing the projected O & M sizes in relation to the portion of the OE appropriation containing O & M costs. As a worst case scenario, a total O & M budget error of five percent over budget for all operating units would be approximately \$25 to \$30 million, an amount that could probably be reprogrammed from other accounts if necessary without major political opposition.

Analysis of the cost budget model was conducted by generating budget predictions from the model for the actual levels of activity provided from the summary information. With activity level differences removed, the usefulness of the model was now observable. The differences between the adjusted actual expenditures and the budget model projections were calculated and converted to percentages of the cost budget projection. The mean and standard deviation of this sample of error percentages were then determined. By finding the mean and standard deviation of this sample and comparing them to the 5 percent standard, a measure of the overall accuracy of the model was made. This procedure was conducted for each platform OG budget. A mean of less than 5 percent would indicate an acceptably accurate model. If one or more standard deviations also fell within 5 percent, that would indicate a high concentration of error of less than 5 percent and so show relatively greater model accuracy. By conducting this analysis on each OG budget, a measurement was obtained

of how well the specific types of costs in each OG were being projected.

To search for activity variables other than those currently used and perhaps to find a better model, regression analysis was conducted on the actual costs adjusted to the FY of the budget model used previously. Regression analysis is a statistical method of fitting a line or curve to a set of data. The method attempts to make the sum of the squared differences between the line or curve being fitted and the actual data as small as possible.

A single or multiple regression was conducted on each OG and total project budget using the same independent variables used in their respective budget models. This was done to enable a comparison between the Cost Estimating Relationship (CER) developed from the regression and the budget model.

A stepwise multiple regression was then performed in an effort to develop a better CER with activity variables that have a stronger relationship to cost than the ones used in the budget model. Stepwise analysis looks for those independent variables that contribute most to the total result while having the smallest mutual interaction. The procedure starts with one independent variable and continues step by step in evaluating each additional independent variable added for the amount of additional contribution it makes. When completed the stepwise multiple regression identified those activity

variables among the ones analyzed that contributed the most to projecting O & M costs.

The actual statistical computations were conducted using the IBM 3033/4381 Network at the Naval Postgraduate School, Monterey, California. The Minitab statistical package as developed by the Pennsylvania State University and described in the Minitab Handbook was used to generate the results for analysis. Minitab was selected for it's simplicity and familiarity. Simple mathematical calculations in consolidating data were done with a Hewlett-Packard calculator, HP-17B.

IV. ANALYSIS OF DATA

The analysis was conducted in two parts to address the basic research questions. The first part centered on analyzing the budget models used for each platform and determining the difference between projected costs and actual costs to measure model accuracy. The second part concentrated on developing Cost Estimating Relationships (CER's) from statistical analysis of the cost histories available for each of the platforms in order to attempt better prediction of future costs.

A. BUDGET MODEL ACCURACY

First, the cost data collected was summarized in several categories for analysis. Aircraft costs were summed for each fiscal year under Operating and Maintenance Costs (OG-30), Aircraft Program (OG-41), and Electronics Program (OG-42). Vessel costs were summed the same way for OG-30, OG-42, and Vessel Program (OG-45).¹ Summaries were made for each fiscal year of total costs charged to each platform under the Operating Expense (OE) Appropriation. This is the sum of OG-30, OG-41, and OG-42 for aircraft and OG-30, OG-42, and OG-45 for vessels. The cost totals for each OG and fiscal year were then adjusted to a base year's constant dollars to

¹ See Chapter II for explanation of OG-30, OG-41, etc.

eliminate inflation effects. The base year was the fiscal year of the budget model used for each platform. Table 1 shows the actual cost data adjusted for inflation.

The budget model used for analysis of each platform was the last model that indicated a change in cost relationships and that was prepared prior to the first platform becoming operational.² This was contained in the Resource Change Proposal (RCP) for follow-on funding to operate the platform. Then, using the actual activity data for each fiscal year, cost predictions were generated from the model. The model for each platform is broken down into cost equations for each operating guide that provides funding.

The first HU-25A was delivered in March of 1982. The budget request for FY 84 was being prepared at the time of delivery so the budget model contained in the HU-25A RCP for FY 84 was chosen for analysis. Complete cost data in all OG's for the HU-25A was not available for FY 82 through FY 84.

The first HH-65A was delivered in November of 1984. The last model that showed a significant change in relationships prior to delivery was contained in the FY 85 RCP for HH-65A follow-on funding. This model was chosen for use. Once again complete cost data for each OG was not available until FY 86.

² See Chapter III for explanation of model selection criteria.

TABLE 1

INFLATION ADJUSTED ACTUAL COST DATA BY PLATFORM & OG³

HU-25A (in FY 84 dollars)

<u>FY</u>	<u>OG-30</u>	<u>OG-41</u>	<u>OG-42</u>	<u>Total OE</u>
1985	9,317,983	14,561,683	5,023,112	28,902,768
1986	8,453,662	34,447,988	5,233,419	48,135,040
1987	8,003,358	17,468,386	2,947,493	28,419,216
1988	5,833,935	26,311,288	89,942	32,235,136

HH-65A (in FY 85 dollars)

<u>FY</u>	<u>OG-30</u>	<u>OG-41</u>	<u>OG-42</u>	<u>Total OE</u>
1986	4,415,413	7,645,919	2,451,844	14,513,176
1987	8,198,760	15,214,315	2,523,044	25,936,112
1988	8,920,478	19,015,398	2,090,417	30,026,272

270 WMEC (in FY 84 dollars)

<u>FY</u>	<u>OG-30</u>	<u>OG-42</u>	<u>OG-45</u>	<u>Total OE</u>
1983	357,205	4,107	34,454	395,766
1984	1,234,381	26,861	93,474	1,354,716
1985	2,279,572	45,186	582,521	2,907,279
1986	4,597,716	509,326	1,169,952	6,276,994
1987	5,854,990	669,412	1,716,011	8,240,413
1988	7,111,166	106,618	1,393,483	8,611,267

110 WPB (in FY 87 dollars)

<u>FY</u>	<u>OG-30</u>	<u>OG-42</u>	<u>OG-45</u>	<u>Total OE</u>
1986	317,485	00	6,773	324,258
1987	2,275,635	29,860	139,316	2,444,811
1988	1,964,164	4,106	851,300	2,819,570

The USCGC BEAR (WMEC 901), the first of the 270 foot medium endurance cutters, was delivered in January of 1983. The budget model in the RCP for follow-on funding in FY 84 was the last to show a change in budget relationships before

³ Inflation rates are contained in Appendix A.

BEAR's delivery. It was chosen for analysis purposes. Cost data was available from FY 83 through FY 88. In November of 1984 the USCGC FARALLON (WPB 1301) was the first of the 110 foot patrol boats to be delivered. The budget model selected came from the FY 87 RCP for follow-on funding which was being prepared at that time. The first cost data became available for the class in FY 86.

Table 2 contains the budget models used and the predicted costs they generated for the aircraft analyzed. Table 3 contains the same information for the cutters. The predictions were generated using actual resource hours (Res Hrs), flight hours, days underway (Days U/W) reported for each FY and the weighted average number of aircraft or cutters for that year. For example, the weighted average for two cutters operational for one half year and one quarter year respectively would be three quarters of a cutter.

Budget model accuracy was measured by computing the absolute difference (i.e., the absolute value of the difference) for each fiscal year between the predicted costs and the actual costs. The difference was then converted into a percentage of the budget model. The mean and standard deviation of these errors were then computed. Table 4 shows the absolute error for each FY, the sample mean with a 95 percent confidence interval (95% CI), and the sample standard deviation for each platform and OG. The means and standard deviations are rounded to two decimal places for display.

Calculations were conducted to seven significant digits by the Minitab program (Minitab, Inc., 1988, p.19). The 95 percent CI was calculated using the Student's t-distribution for small samples and indicates a 95 percent probability that the actual error population mean is within the limits specified (Weiss, 1987, pp. 323-330).

Now the means and confidence intervals (CI) can be compared to the error standard of 5 percent of budget prediction. In every case the sample error mean was far greater than the 5 percent standard. When the 95 percent confidence intervals are used to compare the mean of the population of budget errors to the standard, only two cases find the CI reaching into the acceptable error range. The OG-30 error for the HH-65A and the OG-41 error for the HU-25A have the largest CI's of the platform OG's considered and do expand into the acceptable error range.

All the sample error means were very high. Even the lowest sample error of 37.55 percent for the OG-30 costs for the HU-25A still indicates a difference of some \$3 million between budget and actual expenses. In almost every case for the HU-25A, HH-65A, and 270 WMEC, the budget estimate is consistently higher than the actual costs. Only the 110 WPB had actual costs run higher than budget predictions. In general the error means indicate that general operations and maintenance costs (OG-30) are better predicted than the specific maintenance costs for electronics (OG-42), aircraft

TABLE 2 AIRCRAFT BUDGET MODELS AND COST PREDICTIONS

HU-25A

FY 84 Models:

OG-30 costs = \$59,000/aircraft + \$511,500/flight hour
 OG-41 costs = \$254,000/aircraft + \$530,400/flight hour
 OG-42 costs = no budget found in any FY examined

Predictions:

<u>FY</u>	<u>OG-30</u>	<u>OG-41</u>	<u>Average Aircraft⁴</u>	<u>Flight Hours</u>
1985	13,131,720	20,124,612	33.75	21,780
1986	12,678,268	19,534,856	33.31	20,965
1987	12,711,335	19,401,392	32.26	21,130
1988	11,858,905	18,083,619	30.01	19,723

HH-65A

FY 85 Models:

OG-30 costs = \$65,000/aircraft + \$122,300/flight hour
 OG-41 costs = \$215,100/aircraft + \$527,500/flight hour
 OG-42 costs = no budget found in any FY examined

Predictions:

<u>FY</u>	<u>OG-30</u>	<u>OG-41</u>	<u>Average Aircraft</u>	<u>Flight Hours</u>
1986	2,911,788	11,088,152	22.54	11,829
1987	5,147,074	19,499,896	41.38	20,093
1988	7,170,239	27,122,013	58.30	27,643

* See Table 5 for an explanation of average aircraft.

TABLE 3 CUTTER BUDGET MODELS AND COST PREDICTIONS

270 WMEC

FY 84 Models:

OG-30 costs = \$603,000/cutter + \$6,609/day underway

OG-42 costs = \$282,000/cutter

OG-45 costs = \$909,000/cutter

Predictions:

FY	OG-30	OG-42	OG-45	Avg No Cutters ⁵	Days U/W
1983	695,002	211,500	618,750	0.75	40
1984	2,654,503	705,000	2,272,500	2.50	189
1985	4,927,332	1,362,060	4,390,470	4.83	332
1986	6,734,204	1,480,500	4,772,250	5.25	588
1987	9,386,208	1,926,060	6,208,470	6.83	868
1988	12,368,737	2,608,500	8,408,250	9.25	1,119

110 WPB

FY 87 Models:

OG-30 costs = \$60,000/cutter + \$80.56/resource hour

OG-42 costs = \$11,500/cutter

OG-45 costs = \$297,400/cutter

Predictions:

FY	OG-30	OG-42	OG-45	Avg No Cutters	Res Hrs
1986	219,600	42,090	1,088,484	3.66	479
1987	794,400	152,835	3,593,446	13.29	1,833
1988	1,102,800	211,370	5,466,212	18.38	2,104

⁵ See Table 5 for an explanation of average number of cutters.

TABLE 4 AIRCRAFT AND CUTTER BUDGET ERROR ANALYSIS

HU-25A

FY	OG-30	OG-41	OG-30	Mean	
	Absolute	Absolute	95% CI	±	
	% Error	% Error	Std Deviation		
85	29.04	27.64	OG-41	Mean	37.55%
86	33.32	76.34		95% CI	± 14.99
87	37.04	9.96		Std Deviation	9.42
88	50.81	45.50			

HH-65A

FY	OG-30	OG-41	OG-30	Mean	
	Absolute	Absolute	95% CI	±	
	% Error	% Error	Std Deviation		
86	51.64	31.04	OG-41	Mean	45.11%
87	59.29	21.98		95% CI	± 45.46
88	24.41	29.89		Std Deviation	18.33

270 WMEC

FY	OG-30	OG-42	OG-45	OG-30	Mean	
	Absolute	Absolute	Absolute	95% CI	±	
	% Error	% Error	% Error	Std Deviation		
83	48.60	98.06	94.95	OG-42	Mean	44.62%
84	53.50	96.19	95.89		95% CI	± 15.67
85	53.74	96.68	86.73		Std Deviation	8.92
86	31.73	65.60	75.48			
87	37.62	65.25	72.36	OG-45	Mean	86.28%
88	42.51	95.91	83.43		95% CI	± 28.42
					Std Deviation	16.18

110 WFB

FY	OG-30	OG-42	OG-45	OG-30	Mean	
	Absolute	Absolute	Absolute	95% CI	±	
	% Error	% Error	% Error	Std Deviation		
86	63.16	100.00	99.38	OG-42	Mean	47.58%
87	30.91	80.46	96.48		95% CI	± 40.12
88	48.66	98.06	84.43		Std Deviation	16.15
				OG-45	Mean	92.84%
					95% CI	± 26.73
					Std Deviation	10.76

(OG-41), or vessels (OG-45). Error means for OG-30 ran from about 37 to 47 percent while the OG-41, OG-42, and OG-45 error means ran from a low of about 27 to a high of about 93 percent. Trying to find the reasons for these errors was difficult.

A partial explanation involves the HU-25A. The HU-25A was delayed in delivery due to problems with its engines passing the required safety tests. Some technical problems in mating the engine to the airframe were also experienced, since it was not designed or built by the airframe manufacturer. The delay affected fixed wing operations, since other aircraft had to be procured as a temporary remedy. Once delivery started, the aircraft were used heavily for operations and training. They quickly reached the first mandatory 300 engine hour maintenance and specific parts had to be replaced. Unfortunately the spare parts for the engines had not yet been delivered in sufficient quantities to conduct the maintenance. With more and more aircraft being grounded for mandatory engine maintenance that could not be performed, pressure to get the needed spare parts increased. Speeding procurement pushed the price up and led to higher-than-expected OG-41 costs during two years out of the four years of data available. Even so, the budget predictions were significantly higher in the other two years (9.96% and 27.64%) than the standard error of 5 percent. OG-30 costs were consistently overestimated over that same period.

The HH-65A also has experienced some unexpected problems with corrosion and a parts problem similar to the HU-25A. Still the errors were all in overestimation of the budget not underestimation.

The errors for the 270 WMEC are very high in the OG-42 and OG-45 accounts. BEAR and her sisters initially had some engineering problems, as might be expected for any new ship, and they caused the initial level of operations to be lower than expected for the first few cutters. Still it seems unlikely that this would cause such a large overestimation of the actual expenses.

The apparent underestimation of costs for the 110 WPB may be due more to the current political and budget climate than to poor estimation. The 110 WPB was funded by DoD and several Drug Interdiction/Law Enforcement bills passed by Congress separately from the Coast Guard's annual budget request. Since the amount of money provided to purchase and operate these cutters has not been subject to normal budgetary review up to now, it seems possible that they were provided more money than would have been requested for them. Since funds provided in these special bills must be used in areas mandated by Congress, less management discretion is available to redirect excess resources to other areas; and that could account for the differences.

Explanations for the other errors are not readily identifiable. Perhaps they demonstrate the not uncommon

government practice of padding budget requests to help insure obtaining needed resources. Another reason could be the charging of costs to an inappropriate OG, platform, or command. This could be a particular problem at air stations where several different types of aircraft are operated and identifying overhead costs to charge to a specific aircraft type could be difficult. Cutters provided repair and support services from maintenance assist teams and support centers might also be undercharged for service, as at the air stations.

B. COST ESTIMATING RELATIONSHIPS

Using the cost data in Table 1 and the activity data in Table 5, regression analysis was performed on each OG for each platform to identify the best CER's for predicting actual costs. First, for each OG a linear correlation was computed for each of the activity variables. The linear correlations identified those variables that would seem to have the strongest relation to OG cost behavior because they increase or decrease in a similar manner. Then a plot of the activity variable against the OG costs was done to determine if the relationship was linear or a curvilinear. In all cases it was a linear.

Once the activity variables with the strongest relationship to cost were identified and the relationships determined to be linear, linear regressions were conducted on each variable and pairs of variables to find the regression equa-

tion (called a CER) that best explained the data. In theory if the CER explains the past behavior well then it should be a good predictor of future costs as long as all relationships remain the same.

Through a method called least squares, a simple regression attempts to fit a line to a collection of data so that the sum of the squared differences between the Y value of the line and the actual Y value of the data for each value of X is the smallest number possible. The result is the equation of a line where $y = B_0 + B_1x$. Various sums of the squared values computed in creating the regression are used for evaluation of its usefulness.

Each regression was evaluated using several statistical methods. First, the coefficient of determination, called r^2 , is checked because it is "a descriptive measure of the utility of the regression equation in making predictions" (Weiss, 1987, p.519). r^2 represents the percentage reduction in the total squared error obtained by the regression equation. More simply put, it is the percentage of the variation in the actual cost values explained by the regression equation. The higher the r^2 value the better the regression equation is at explaining the cost values. In general the r^2 values in this analysis were very high since the correlation between cost values and each activity variable was very high.

TABLE 5 AIRCRAFT AND CUTTER ACTIVITY DATA

HU-25A

<u>FY</u>	<u>Flight Hours</u>	<u>Sorties</u>	<u>Avg A/C</u>
85	21,780	8,928	33.75
86	20,965	8,872	33.13
87	21,130	8,875	32.26
88	19,723	8,397	30.01

HH-65A

<u>FY</u>	<u>Flight Hours</u>	<u>Sorties</u>	<u>Avg A/C</u>
86	11,829	7,769	22.54
87	20,093	14,000	41.38
88	27,643	19,603	58.30

270 WMEC

<u>FY</u>	<u>DAFHP</u>	<u>DAYS U/W</u>	<u>Msn</u>	<u>Resource Hours</u>	<u>Days AFO</u>	<u>Avg No</u>	<u>Investment Value</u>
83	228	40	10	692	40	0.75	683,879,936
84	578	189	57	2,854	247	2.50	697,879,808
85	856	332	96	5,762	501	4.83	752,176,824
86	622	588	220	11,421	673	5.25	752,176,824
87	1,116	858	370	17,511	1,102	6.83	756,573,952
88	1,555	1,119	406	21,799	1,514	9.25	766,573,824

110 WPB

<u>FY</u>	<u>DAFHP</u>	<u>DAYS U/W</u>	<u>Msn</u>	<u>Resource Hours</u>	<u>Days AFO</u>	<u>Avg No</u>	<u>Investment Value</u>
86	607	479	264	7,972	619	3.66	63,000,000
87	1,833	1,833	1,150	31,026	2,740	13.29	112,000,000
88	2,282	2,104	1,927	33,797	3,629	18.38	161,000,000

TABLE 5 AIRCRAFT AND CUTTER ACTIVITY DATA - CONTINUED

Activity Categories:

Flight Hours (Flt Hrs): actual recorded flying hours recorded in an FY.

Sorties: actual number of start up/take-off/landing/shut down cycles recorded in an FY.

Average Number of Aircraft (Avg A/C): weighted average number of aircraft operating during an FY.

Days Away From Home Port (DAFHP): actual number of whole days a cutter spends away from its home port. This time is not necessarily spent underway or performing operational missions.

Total Days Underway (Days U/W): total number of days the cutter was underway during an FY.

Missions (Msn): total number of incidents that require a resource to respond in a specific Coast Guard role. For example, a boat that is sinking is assisted by a unit. While providing assistance the Coast Guard unit discovers illegal narcotics. This would be recorded as one Search and Rescue mission and one Law Enforcement mission.

Resource Hours (Res Hrs): Total number of hours a cutter is involved only in Coast Guard operational missions.

Days Available For Operations (Days AFO): Total number of days a cutter is available for operations. It is the total of days underway, days spent in a standby status, and inport days that do not involve major maintenance.

Average Number of Cutters (Avg No): weighted average number of cutters operating during an FY.

Investment Value: Cumulative total amount of Acquisition, Construction, and Improvements appropriations spent on obtaining a cutter class. Figures for aircraft were not obtained.

After finding the regressions with the highest r^2 values, the t-ratios for the B_0 and B_1 values were tested. This is a hypothesis test using Student's t-distributions. The null hypothesis is that the coefficient or constant tested is not statistically different from zero. The alternative hypothesis is that the coefficient or constant is statistically different from zero. The test was done by comparing the t-ratio to a critical value from the appropriate t-distribution. A significance level of 0.05 was used for this test, so that the chances of rejecting the null hypothesis (H_0) when it should have been accepted are 5 percent. Then the number of degrees of freedom (df) for each regression is determined from the number of observations (n) in the data: $df = n - 2$. Now the t-distribution table for a 0.05 significance level is used to identify the critical value, denoted as $t_{\alpha/2}$. This test is called a two-tailed test since we are checking to see if B_0 and B_1 are significantly greater than or less than zero. If the t-ratio generated is smaller than the positive critical value or larger than the negative critical value, then H_0 is accepted as true. If it is not, then the alternative hypothesis is true and the B value tested is meaningful.

Lastly the entire regression equation itself is tested in a method similar to the t-test for each of B_0 and B_1 . The procedure is called analysis of variance. Here we test the null hypothesis that the regression equation is no better a

predictor of actual costs than the mean value of those costs. This is done by first calculating the sum of the squared differences between the mean of actual costs and the regression predicted costs. Then the mean of this value yields the Regression Sum of Squares (SSR). The SSR is then divided by its degrees of freedom to yield the Mean Treatment Sum of Squares (MSTR). Next the mean of the sum of the squared differences between the regression predicted costs and the actual costs is calculated to yield the Error Sum of Squares (SSE). The SSE is divided by its degrees of freedom to yield the Mean Error Sum of Squares (MSE). The F-statistic is generated by dividing the MSTR by the MSE. This test is a one-tailed test because it checks only to see if the F-statistic is significantly greater than one according to the F-distribution. This indicates that the regression equation better explains the cost values than the mean of the cost values. The F-statistic is compared to the critical value from the appropriate F-distribution table. This critical value is symbolized by the letter F with two subscripted numbers following it, which indicate the degrees of freedom of the F distribution. Again a significance level of 0.05 was used. If the F-statistic is greater than the critical value, then the null hypothesis is rejected and the regression is significant. If it is less than the critical value than the null hypothesis is accepted and the regression is not useful.

In order to identify which activity variables would be the best to use in a regression, a linear correlation analysis was conducted between each OG cost and activity variable. Activity variables with strong correlation to OG cost are good predictors in a regression. In addition, correlations were obtained between each of the activity variables to identify which ones were strongly correlated and so probably not suitable for use in a multiple regression.

A linear correlation is expressed as a coefficient which "is a single number that can be used to describe the strength of the linear (straight-line) relationship between two variables" (Weiss, 1987, p.525). The correlation coefficient, r , is a number between +1 and -1. The closer the coefficient is to +1 or -1, the stronger the linear relationship between the variables. The closer r gets to zero, the weaker the linear relationship. r values near +1 are positively correlated and indicate that both variable change linearly in the same direction, that is they increase and decrease at the same time. r values near -1 are negatively correlated indicating that they change in opposite directions. As one increases the other decreases.

1. CER's for the HU-25A

Table 6 shows the correlation analysis for the HU-25 OG-30, OG-41, OG-42 funds and total OE appropriations. It also shows, in the two columns on the right, the correlation between each of the activity variables. Strong positive

correlations (greater than 0.5) were obtained for OG-30 and OG-42 costs, while weak or no correlations were obtained for OG-41 and total OE costs.

TABLE 6
CORRELATION ANALYSIS FOR HU-25A COSTS & ACTIVITY VARIABLES

	<u>OE</u>	<u>OG-30</u>	<u>OG-41</u>	<u>OG-42</u>	<u>Flt Hrs</u>	<u>Sorties</u>
Flt Hrs	-.116	0.978	0.328	0.866		
Sorties	0.103	0.960	0.407	0.914	0.949	
Avg A/C	0.189	0.995	-.372	0.977	0.951	0.953

There was virtually no correlation between any of the activity variables and total OE costs of the HU-25A. Regressions were run on each variable as well as for all combinations of two variables.⁶ As expected, no significant regressions were identified, as both t-tests and analysis of variance failed to show significance. Multiple regression with two variables also yielded no significant results.

All variables showed very strong correlation to OG-30 costs. The average number of aircraft was the first variable tested because it had the highest correlation. It yielded the most significant regression of all the single variables tested, with an r^2 value of 99.0 percent. Further, both t-test and analysis of variance proved the regression equation's significance. Because of the large amount of interaction between the activity variables, as shown by the correlation results, multiple regressions did not make a

⁶ Appendix C contains the Minitab output for the regressions computed.

significant improvement in the r^2 value. The regression results for average number of aircraft were as follows:

$$\text{OG-30} = -21,196,960 + 901,253 \text{ Avg A/C}$$

$r^2 = 99.0\%$	<u>Predictors</u>	<u>t-ratio</u>	<u>t₂</u>
F = 189.63	Constant	-10.02	4.30
F _{1,2} = 18.51	Avg A/C	13.77	

Activity variable correlations for OG-41 costs were weak, less than 0.5 in two cases and weakly negative in the third. None of the regressions was significant for either t-test of the coefficients or analysis of variance of the regression. Sorties showed the highest r^2 value, 16.6 percent.

The correlations for OG-42 costs were very strong. Regressions of flight hours, sorties, and average number of aircraft all gave r^2 values of over 75.0 percent. The best regression and the only one to be significant was for the average number of aircraft. The results were:

$$\text{OG-42} = -42,756,912 + 1,427,190 \text{ Avg A/C}$$

$r^2 = 95.5\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₂</u>
F = 42.82	Constant	-6.07	4.30
F _{1,2} = 18.51	Avg A/C	6.54	

2. CER's for the HH-65A

Table 7 show the correlation results for the HH-65A costs. All variables showed very strong correlations, both positive and negative, to costs. Regression analysis was limited because all of the activity variables were perfectly correlated with each other. Multiple regressions were not conducted. None of the regressions proved significant in

analysis of variance due to the small amount of data (three years) available in the sample. Also, many times the regression coefficients failed the t-test for significance, again due to the small sample size.

TABLE 7
CORRELATION ANALYSIS FOR HH-65A COSTS & ACTIVITY VARIABLES

	<u>OE</u>	<u>OG-30</u>	<u>OG-41</u>	<u>OG-42</u>	<u>Flt Hrs</u>	<u>Sorties</u>
Flt Hrs	0.971	0.940	0.987	-.762		
Sorties	0.972	0.942	0.987	-.759	1.000	
Avg A/C	0.972	0.942	0.988	-.759	1.000	1.000

Both average number of aircraft and sorties showed strong correlations and, as expected, proved excellent predictors of total OE costs for the aircraft. The average number of aircraft proved very slightly better with an r^2 value of 94.6 percent compared to 94.5 percent for sorties. Both regressions were found not to be significant by analysis of variance and t-test. Because the activity coefficients were perfectly correlated, multiple regressions were not done. The best results were as follows:

$$\text{Total OE} = 5,685,976 + 437,061 \text{ Avg A/C}$$

$r^2 = 94.6\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 17.38	Constant	1.25	12.71
F _{1,1} = 161.4	Avg A/C	4.17	

$$\text{Total OE} = 5,279,717 + 1,321 \text{ Sorties}$$

$r^2 = 94.5\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 17.32	Constant	1.14	12.71
F _{1,1} = 161.4	Sorties	4.16	

Similar results were obtained for OG-30 costs. Again sorties and the average number of aircraft had the highest correlations. Both regressions had high r^2 values, but neither coefficients nor the regressions themselves were found significant. There results follow:

$$\text{OG-30} = 1,988,331 + 127,390 \text{ Avg A/C}$$

$r^2 = 88.7\%$	<u>Predictors</u>	<u>t-ratio</u>	<u>t₁</u>
F = 7.85	Constant	1.01	12.71
F _{1,1} = 161.4	Avg A/C	2.80	

$$\text{OG-30} = 1,870,142 + 385 \text{ Sorties}$$

$r^2 = 88.7\%$	<u>Predictors</u>	<u>t-ratio</u>	<u>t₁</u>
F = 7.83	Constant	0.93	12.71
F _{1,1} = 161.4	Sorties	2.80	

Results of the OG-41 regressions were slightly better than those for OG-30. Once again sorties and average number of aircraft proved the best predictors with the same r^2 value of 97.5 percent. Analysis of variance proved none of the regressions significant and the t-test of coefficients showed none of the activity variable coefficients as significant. The average number of aircraft had slightly better results as shown here.

$$\text{OG-41} = 941,432 + 319,517 \text{ Avg A/C}$$

$r^2 = 97.5\%$	<u>Predictors</u>	<u>t-ratio</u>	<u>t₁</u>
F = 39.38	Constant	0.43	12.71
F _{1,1} = 161.4	Avg A/C	6.27	

$$\text{OG-41} = 644,048 + 965 \text{ Sorties}$$

$r^2 = 97.5\%$	<u>Predictors</u>	<u>t-ratio</u>	<u>t₁</u>
F = 39.19	Constant	0.29	12.71
F _{1,1} = 161.4	Sorties	6.29	

Lastly, OG-42 followed the same pattern as the others except for the r^2 values, which were much lower (50 to 60% range) than most of the other cost regressions run for this aircraft. Also, this time flight hours proved to be the slightly better predictor.

$$\text{OG-42} = 2,799,063 - 22.4 \text{ Flt Hrs}$$

$r^2 = 58.1\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 1.39	Constant	7.06	12.71
F _{1,1} = 161.4	Flt Hrs	-1.18	

$$\text{OG-42} = 2,765,516 - 29.8 \text{ Sorties}$$

$r^2 = 57.7\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 1.36	Constant	7.42	12.71
F _{1,1} = 161.4	Sorties	-1.17	

3. CER's for the 270 WMEC

The correlation analysis for the 270 WMEC is contained in Table 8. All of the activity variables showed a positive correlation to costs. Like the aircraft variables, the cutter variables were also strongly correlated with each other but not to the unusually high degree. Multiple regressions were conducted for the cutters and more significant results were obtained.

TABLE 8

CORRELATION ANALYSIS FOR 270 WMEC COSTS & ACTIVITY VARIABLES

	<u>OE</u>	<u>OG-30</u>	<u>OG-42</u>	<u>OG-45</u>
DAFHP	0.837	0.879	0.241	0.768
DaysU/W	0.976	0.993	0.518	0.923
Missions	0.985	0.988	0.610	0.952
Res Hrs	0.981	0.994	0.545	0.934
Days AFO	0.951	0.977	0.440	0.892
Avg No	0.937	0.962	0.425	0.884
FY	0.979	0.991	0.540	0.935
Inv Cost	0.874	0.871	0.526	0.874

	<u>DAFHP</u>	<u>Days</u> <u>U/W</u>	<u>Msns</u>	<u>Res</u> <u>Hrs</u>	<u>Days</u> <u>AFO</u>	<u>Avg</u> <u>No</u>	<u>FY</u>
Days U/W	0.922						
Missions	0.883	0.990					
Res Hrs	0.907	0.999	0.995				
Days AFO	0.956	0.994	0.975	0.990			
Avg No	0.959	0.973	0.940	0.963	0.983		
FY	0.923	0.991	0.976	0.987	0.985	0.988	
Inv Cost	0.819	0.849	0.820	0.840	0.850	0.922	0.906

The best simple regression for total OE costs used total number of missions. The regression yielded an r^2 value of 97.1 percent but failed to show significance in the analysis of variance. t-tests of the coefficients showed the missions coefficient to be significant, but not the constant. The best multiple regression on total OE costs used days away from home port and fiscal year as activity variables. This regression yielded an r^2 value of 98.8 percent. The analysis of variance proved significant and two of the regression coefficients were significant by t-test. There was, as expected, a large amount of interaction or "overlap" between the two variables. The simple and multiple regression results follow.

Total OE = 569,437 + 21,027 Missions

$r^2 = 97.1\%$	<u>Predictor</u>	<u>t-test</u>	<u>t₄</u>
F = 132.91	Constant	1.27	2.78
F _{1,4} = 224.6	Missions	11.53	

Total OE = -218,911,040 + 2,647,748 FY - 3,439 DAFHP

$r^2 = 98.8\%$	<u>Predictor</u>	<u>t-test</u>	<u>t₄</u>
F = 119.32	Constant	-8.36	2.78
F _{2,3} = 9.55	FY	8.33	
	DAFHP	-2.68	

The best simple regression for OG-30 costs used total resource hours as its activity variable or cost driver. This regression had an r^2 value of 98.7 percent and analysis of variance proved its significance. Its weakness lies in the significance of the constant value, which failed the t-test. Still, overall, it is a very good predictor. Multiple regressions yielded higher r^2 values but the amount of interaction between variables was so high that the single regression was considered the better predictor. In addition, only one of the multiple regression coefficients proved significant. The resource hours regression and the best multiple regression are shown below.

OG-30 = 387,191 = 318 Res Hrs

$r^2 = 98.7\%$	<u>Predictor</u>	<u>t-test</u>	<u>t₄</u>
F = 312.71	Constant	1.71	2.78
F _{1,4} = 224.6	Res Hrs	17.68	

OG-30 = -6,241,345 + 285 Res Hrs + 0.0095 Inv Cost

$r^2 = 99.2\%$	<u>Predictor</u>	<u>t-test</u>	<u>t₄</u>
F = 180.78	Constant	-1.96	2.78
F _{2,3} = 9.55	Res Hrs	9.23	
	Days-U/W	1.27	

The results of the OG-42 regressions were poor. The best simple regression achieved an r^2 value of only 37.2 percent. None of the simple regressions proved significant by analysis of variance and none of the regression coefficients proved significant in t-testing. Multiple regressions had similar results, with the exception that in the best multiple regression one of the activity variable coefficients proved significant. The best r^2 value achieved was 77.3 percent with less interaction between variables than had occurred in other multiple regressions conducted but also with more unexplained error than in previous regressions. The best simple and multiple regressions are shown below.

$$\text{OG-42} = 23,856 + 1,051 \text{ Missions}$$

$r^2 = 37.2\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₄</u>
$F = 2.37$	Constant	0.14	2.78
$F_{1,4} = 224.6$	Missions	1.54	

$$\text{OG-42} = 316,601 + 3,101 \text{ Missions} - 834 \text{ DAFHP}$$

$r^2 = 77.3\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₄</u>
$F = 5.10$	Constant	1.83	2.78
$F_{1,4} = 224.6$	Missions	3.07	
	DAFHP	-2.30	

Regressions for OG-45 showed a better result from a multiple regression with FY and DAFHP than from any simple regression. The r^2 value was 93.3 percent and analysis of variance proved the regression to be significant. Both the constant and the FY coefficient proved significant but the DAFHP coefficient did not. The overlap of the activity variables was 56.68 percent. The same coefficient of

determination was achieved in a regression of missions and investment costs, which proved significant in analysis of variance but had only one significant variable in the t-test. The best simple regression used missions and achieved an r^2 value of 90.6 percent. The regression did not prove significant in analysis of variance nor did the regression constant in the t-test. The best multiple regression and the best simple regression are shown here.

$$\text{OG-45} = 58,290 + 4,004 \text{ Missions}$$

$r^2 = 90.6\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₄</u>
$F = 38.77$	Constant	0.37	2.78
$F_{1,4} = 224.6$	Missions	6.23	

$$\text{OG-45} = -47,124,688 + 570,179 \text{ FY} - 961 \text{ DAFHP}$$

$r^2 = 93.3\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₄</u>
$F = 21.02$	Constant	-3.94	2.78
$F_{2,3} = 9.55$	FY	3.93	
	DAFHP	-1.64	

4. CER's for the 110 WPB

Table 9 shows the results of the correlation analysis for costs and activity variables of the 110 WPB. In general correlations were fairly high except for OG-42 costs. Regression results obtained high r^2 values overall but failed to prove significant in analysis of variance in most cases. This was due to the very small amount of data available (3 years).

TABLE 9

CORRELATION ANALYSIS FOR 110 WPB COSTS & ACTIVITY VARIABLES

	<u>OE</u>	<u>OG-30</u>	<u>OG-42</u>	<u>OG-45</u>
DAFHP	0.993	0.917	0.379	0.803
Days U/W	1.000	0.954	0.475	0.735
Missions	0.941	0.805	0.164	0.915
Res Hrs	0.999	0.970	0.525	0.695
Days AFO	0.988	0.905	0.352	0.820
Avg No	0.979	0.880	0.299	0.851
Inv Cost	0.927	0.782	0.127	0.930

	<u>DAFHP</u>	<u>Days</u> <u>U/W</u>	<u>Msns</u>	<u>Res</u> <u>Hrs</u>	<u>Days</u> <u>AFO</u>	<u>Avg</u> <u>No</u>
Days U/W	0.994					
Missions	0.975	0.946				
Res Hrs	0.987	0.998	0.926			
Days AFO	1.000	0.991	0.981	0.981		
Avg No	0.996	0.982	0.990	0.969	0.998	
Inv Cost	0.966	0.933	0.999	0.911	0.973	0.985

The results of the total OE regressions for the 110 WPB showed that days underway was an outstanding predictor of total OE costs in a simple regression. The r^2 value was 100 percent. The analysis of variance was significant and the regression coefficients for days underway was also. Unfortunately, it is important to remember that the regression was done only on the three years of data available. The next strongest predictor was resource hours with an r^2 value of 99.8 percent and a significant analysis of variance. The regression constant failed the t-test but it only just failed. Because the simple regressions gave such high r^2 values and the high correlation between activity variables, no multiple regressions were done on total OE costs. The results are summarized here.

Total OE = -411,966 + 1,545 Days U/W

$r^2 = 100\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 3640.54	Constant	-9.84	12.71
F _{1,1} = 161.4	Days U/W	60.34	

Total OE = -438,030 + 94.8 Res Hrs

$r^2 = 99.8\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 570.84	Constant	-4.22	12.71
F _{1,1} = 161.4	Res Hrs	23.89	

OG-30 regressions had similar r^2 values to that of the total OE costs but none of the analysis of variances proved the results to be significant. None of the regression coefficients showed significance either. The highest coefficient of determination, best t-ratios, and best F-statistic were generated by the simple regression with resource hours. Days underway had the next best result. Again the problems with these regressions is most likely the small sample size. The regression summarizations follow.

OG-30 = -227,315 + 72.0 Res Hrs

$r^2 = 94.0\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 15.80	Constant	-0.47	12.71
F _{1,1} = 161.4	Res Hrs	3.98	

OG-30 = -178,007 + 1,153 Days U/W

$r^2 = 91.0\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
F = 10.10	Constant	-0.30	12.71
F _{1,1} = 161.4	Days U/W	3.18	

Regressions on OG-42 costs had very poor results, as was expected from the weak correlation of activity variables to OG-42 costs. Due to the very high correlation between activity variables only simple regressions were attempted.

Even these yielded low values for r^2 . None of the regressions coefficients nor any analysis of variance proved significant results. The best results came again from resource hours with an r^2 value of 27.6 percent. Days underway was the second best predictor with a value of 22.5 percent for r^2 . The best two results are summarized here.

$$\text{OG-42} = -3,225 + 0.6 \text{ Res Hrs}$$

$r^2 = 27.6\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
$F = 0.38$	Constant	-0.12	12.71
$F_{1,1} = 161.4$	Res Hrs	0.62	

$$\text{OG-42} = -1,666 + 8.82 \text{ Days U/W}$$

$r^2 = 22.5\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
$F = 0.29$	Constant	-0.06	12.71
$F_{1,1} = 161.4$	Days U/W	0.54	

The regressions on OG-45 costs showed some surprising results. As before, only simple regressions were run due to the high correlation between the activity variables. The best result was generated by investment cost (not resource hours or days underway), which yielded an 86.4 percent r^2 value. As before, none of the regressions or regression coefficients proved significant. The best regression is summarized here.

$$\text{OG-45} = -632,711 + 0.00862 \text{ Inv Cost}$$

$r^2 = 86.4\%$	<u>Predictor</u>	<u>t-ratio</u>	<u>t₁</u>
$F = 6.38$	Constant	-1.56	12.71
$F_{1,1} = 161.4$	Inv Cost	2.52	

V. CONCLUSIONS AND RECOMMENDATIONS

A. BUDGET MODEL PERFORMANCE

The first primary research question ("How well do the O & M budget models predict actual costs") is easy to answer, given the analysis results. The budget models studied did a very poor job in estimating the actual O & M costs of new platforms. Mean errors ran from a low of 37.5 percent for the HU-25A OG-30 costs to a high of 93.7 percent of budget estimate for the 110 WPB OG-45 costs. These are not good predictions by any standard let alone the 5 percent of budget standard used in this analysis.

The errors were significant in every operating guide examined though some showed better accuracy than others. In general, OG-41 costs were consistently better estimated than any others. All the OG-41 budget predictions were in error by less than 40 percent of budget. The costs for OG-30 were also better predicted, with errors consistently under 50 percent and relatively small standard deviations. While showing very large errors, the OG-42 and OG-45 errors were surprising consistent in the amount of the error. Their standard deviations were not that much larger than those for OG-30 and OG-41. It is also important to remember that the error values are absolute values and in some situations the

errors were over budget vice under budget.¹ Aircraft costs seemed on the whole to be better predicted than those for cutters. The most significant result, however, was that most O & M costs were highly overestimated.

The reasons for these errors is difficult to determine. Naturally, each procurement program had it's own unique circumstances that could have influenced the O & M costs for the platform. For example, as mentioned in Chapter IV, the HU-25A developed engine and parts problems during procurement because of the selection of a previously never-used engine for use in the aircraft. The engine experienced higher-than-expected repair parts consumption, as noted in testimony on the Coast Guard's FY 83 budget request before the House Appropriations Committee's (HAC) Subcommittee on DoT Appropriations (HAC Hearings, 98th Congress, 1st Session, 1983, p.504). Because the HU-25A was not operated by DoD, parts for it were not already being procured by the government. This required the Coast Guard to build a complete parts inventory for the aircraft instead of using DoD's stock system as had been done for other aircraft in the service's inventory. This problem, coupled with the high repair parts usage which persisted for several years, could account for OG-41 costs being over the inflation adjusted budget in FY 85 and FY 88. It does not, however, account for the over-

¹ See Chapter IV (A) for details of error directions.

estimation of OG-41 costs or of OG-30 costs in the other fiscal years.

The HH-65A had a repair parts problem for reasons similar to those for the HU-25A, according to Coast Guard testimony before the HAC on the FY 85 budget (HAC Hearings, 99th Congress, 1st Session, 1985, p.777). OG-41 predictions, however, were the costs consistently overestimated. It was OG-30 costs that were underestimated. It seems unlikely that OG-30 underestimation would be related to the parts problem, since it would have been inappropriate to charge those expenses to OG-30. Still, this could have been a contributing factor, since OG-30 is a general "catch-all" account, frequently charged when in doubt.

No explanation other than the effect of new ship engineering problems on operational activity could be provided for the overestimation of O & M costs for the 270 WMEC. While the 110 WPB OG-30 costs were underestimated, OG-42 and OG-45 costs were grossly overestimated. Explaining these discrepancies is not easy. The OG-30 costs could be accounted for by looking at the funding source. The 110 WPB's were bought with funds transferred from DoD and from anti-narcotics legislation funded separately by Congress. The facts that OG-30 costs would be most affected by increased operation and Congress was funding stepped up enforcement efforts with funds that could not be used elsewhere could

explain the difference. The OG-42 and 45 errors are not directly explainable. However, since OG-30 was "rich" from special funding, costs properly charged to OG-42 and 45 might have been charged to OG-30 to take advantage of this funding for the 110 class and leave the other operating guides with funds to spend on other cutter classes not receiving the extra funds.

All the overestimation may be part of a routine effort to plan for the unexpected both in terms of operations and in terms of funding. Catastrophic failures or accidents occur and funds are always needed to handle them. A common government "budget ploy" is to ask for more than you need to give reviewers something to cut. The budget climate of the 80's has not been a rich one for the Coast Guard, so it seems unlikely that the O & M budgets were padded to the extent of 80 to 90 percent, as determined here. In short, it is not clear why overestimation of O & M budgets was as severe as indicated or if the models could have done a better job.

B. PARAMETRIC METHODS

Parametric methods of estimations like regression analysis would seem to be very suitable for use by the Coast Guard. Generally strong Cost Estimating Relationships (CER's) were developed for all the platforms. Exceptionally high r^2 values were obtained. While some regressions were not statistically significant probably because of the small

sample sizes, the high coefficients of determination indicate that the technique could be worth using.

The CER's generated do a much better job of predicting the actual costs incurred than do the budget models. Days away from home port, sorties, resource hours, flight hours, days underway, missions, and fiscal year all proved to be good activity parameters to use in predicting the O & M costs of aircraft and cutters.

C. GENERAL CONCLUSIONS AND RECOMMENDATIONS

This analysis indicates that the present method of estimating the O & M costs of new platforms is highly inaccurate and could lead to selection of the wrong platform in a LCC analysis. In particular, the costs for electronics maintenance and vessel maintenance seem to be the least understood. Perhaps the overestimation is a reflection of a concern for sufficient funding to cover unexpected major casualties. The general housekeeping, fuel and aircraft repair costs are the best estimated, though accuracy in these areas is still not very good.

An important question which came up repeatedly in trying to find the reasons for these errors related to proper charging of costs to an operating guide. Because most operating units only have direct control of OG-30 funds, emergency repairs and time critical purchases are often charged to OG-30 instead of a more appropriate account.

Thus, CGHQ may be inadvertently budgeting for costs twice in estimating OG-30 costs and other maintenance accounts.

Identifying practices for charging accounts is very difficult and takes on-site observation. Correcting problems discovered takes training and the commitment of all levels of the chain of command.

The strong results of parametric methods of cost estimation warrant further research using larger samples. A practical application of this analysis is to group platforms into general categories such as patrol boats, short range recovery helicopters, medium endurance cutters, etc., and collect cost and activity data on all platform classes that fall in these categories for a 10 to 15 year period. This data would be used as a basis for generating CER's to be used in estimating O & M costs for new platforms of the same category. Adjustments for inflation and any unique equipment with special costs could be used to fine tune the results. This might be a more accurate, less time consuming method of estimation. It would put the majority of the guess work into predicting activity levels instead of estimating cost relationships.

APPENDIX A. INFLATION RATES

The following inflation rates were used to adjust actual cost data to the budget year for the budget model used for analysis. These percentage rates were taken from the Consumer Price Index for All Urban Consumers (CPI-U) as listed in the publication Economic Indicators compiled by the Council of Economic Advisors in January 1989.

<u>Fiscal Year</u>	<u>CPI-U</u>
1983	3.2%
1984	4.3%
1985	3.6%
1986	1.9%
1987	3.6%
1988	4.1%

APPENDIX B. COST AND ACTIVITY DATA

FY 84 OPERATING COSTS FOR COMPARISON FY 85 VS FY 84													
A/C TYPE	NUMBER OF A/C	FLT. HRS	FUEL COSTS	MAINT. OTHER	A/C PROP.	ELEC. COSTS	SHORE UNIT COSTS	OTHER COSTS	TOTAL	PER A/C	PER FLT. HR.		
MC-130 F18A	20-03	19,434	28,844,910	2,943,818	4,492,920	14,402,598	1,842,280	885,445	710,770	34,442,941	1,951,187		
F18A	31-72	21,115	27,941,494	4,400,119	5,815,244	17,083,015	-168,750	492,484	596,331	34,404,332	1,778,195		
VARIANCE													
F18A-F18B	-2.49	-1,679	881,214	-1,177,324	-400,417	2,011,039	192,981	112,439	278,429	172,993	243		
F18A-F18B/F18C	-8.48%	-7.95%	3.15%	-32.44%	-19.10%	-2.34%	119.144%	27.84%	18.79%	0.42	9.73%		
MC-130 F18A	33-12	20,965	21,121,185	4,374,986	4,547,409	36,344,190	5,524,837	811,499	779,858	73,528,164	2,220,053		
F18B	38-75	21,780	20,412,351	4,842,798	4,510,433	15,085,904	5,203,944	514,299	642,283	51,737,212	1,407,479		
VARIANCE													
F18A-F18B	-3.43	-815	508,834	-465,812	241,724	21,280,284	320,893	277,400	137,575	21,795,952	812,374		
F18A-F18B/F18C	-9.88%	-3.74%	2.47%	-9.62%	5.47%	141.04%	6.17%	51.92%	21.42%	42.13	57.71%		
MC-130 F18A	57-41	30,023	33,909,046	2,583,050	7,751,914	7,190,920	788,742	1,998,441	1,402,148	55,624,261	948,895		
F18B	64-92	40,488	37,732,906	4,828,411	8,768,487	8,767,189	-1,741,417	1,219,245	1,209,894	60,795,135	908,475		
VARIANCE													
F18A-F18B	-9.51	-10,465	-3,823,860	-2,245,561	-1,046,773	-1,574,269	2,550,159	779,174	192,254	-5,170,874	-40,420		
F18A-F18B/F18C	-14.21%	-26.21%	-10.13%	-46.51%	-11.90%	-17.98%	144.78%	63.91%	15.89%	-8.65%	24.00%		
MC-130 F18A	20-39	18,479	23,361,202	10,514,354	3,415,630	7,578,345	518,844	413,229	428,739	46,435,347	2,253,092		
F18B	19-11	19,878	19,843,008	14,615,449	4,153,719	9,824,945	-719,884	407,194	330,356	48,656,807	2,546,144		
VARIANCE													
F18A-F18B	1.48	-1,199	3,518,194	-4,299,093	-738,089	-2,248,420	1,238,730	206,035	98,382	-2,824,460	-291,052		
F18A-F18B/F18C	7.74%	-6.03%	17.73%	-29.02%	-17.77%	-22.88%	172.07%	50.40%	29.78%	-4.57	-11.43%		
UC11A F18A	1	530	682,158	274,794	134,388	373,011	18,993	1,035	20,378	1,204,957	1,504,957		
F18B	1	485	677,143	310,870	210,516	304,809	-10,320	1,744	17,008	1,511,790	1,511,790		
VARIANCE													
F18A-F18B	0	45	4,995	-36,076	-74,128	48,202	29,313	-709	3,570	-4,833	-4,833		
F18A-F18B/F18C	0.00%	9.28%	0.74%	-11.40%	-35.21%	22.38%	284.04%	-40.65%	20.99%	-0.32	-0.32%		
UC4A F18A	1	439	477,738	244,047	134,745	330,315	19,484	1,035	20,408	1,247,972	1,247,972		
F18B	1	594	505,184	274,444	184,444	397,650	-26,593	1,744	17,008	1,355,085	1,355,085		
VARIANCE													
F18A-F18B	0	43	-27,446	-10,397	-49,903	-67,335	45,077	-709	3,400	-107,113	-107,113		
F18A-F18B/F18C	0.00%	7.21%	-5.43%	-3.79%	-27.03%	-14.93%	174.13%	-40.65%	21.17%	-7.90	-7.90%		
MC-130 F18A	22-52	12,585	13,197,798	1,508,047	2,991,239	7,791,191	2,498,429	734,931	551,118	29,274,773	1,299,944		

AIRCRAFT REPORT FY 87

HH 65A

AIR STATION	OPFAC	NUMBER OF A/C ASSIGNED	FLT HRS	PERSON. COST	FUEL O.G. - 2	MAINT O.G. - 30	A/C PROG. O.G. - 41	ELEC. PROG. O.G. - 42	SHORE & OTHER COST	Indirect Costs	TOTAL
Brown	20121	514	2866	2773500	201157	1514872	-	-	873443	-	5356233
Cape May	20120	514	1445	1416800	94797	381504	-	-	-	-	1802211
Savannah	20125	514	1110	1049819	94572	414046	-	-	414046	-	2239274
Miami	20124	514	428	3304937	376450	1280657	-	3446	283657	-	5529747
Clearwater	20126	-	-	-	-	-	-	-	-	-	-
Birmingham	20125	514	2274	2820337	143335	2001129	-	4430	424123	-	5565253
Corpus Christi	20125	514	1765	1593721	150060	441384	-	-	10163	-	1785030
New Orleans	20126	514	3216	3012834	273590	381290	-	5281	263270	-	3945755
San Diego	20126	514	2058	2276524	174971	424694	-	2062	101493	-	3277344
Los Angeles	20125	-	-	-	-	-	-	-	-	-	15617
Astoria	20125	63	253	767100	21510	172445	-	-	34244	-	996239
Barbers point	20125	440	890	1035100	33657	315338	6018	11799	74859	-	1436201
Trane West Cots	-	-	17030	2411544	1617209	7037371	6018	16959	2324958	-	21116684
Direct Support Facility	20135	-	-	-	-	-	10059497	2676578	-	-	10700069
Indirect Costs	-	-	-	-	-	-	-	-	-	14523541	14523541
Grand Total	-	-	-	24115449	1617209	7037371	2061509	2663537	2522952	14523541	46542294

AIRCRAFT REPORT FY 87

HL25A

AIR STATION	OPFAC	NUMBER OF A/C ASSIGN	FLT HRS	PROG. COST	FUEL	MAINT	A/C PROG.	ELEC. PROG.	SHORE OTHER COST	Indnt. COST	TOTAL
CAPE BOB	20115	1516	3063	480649	100959	910549	-	57099	50493	-	690281
ELIZ. CITY	20130	242	1481	422252	425412	60799	32049	149	32	-	144137
MIAMI	20140	638	4518	4211254	1297840	144066	-	3882	319896	-	732718
BOZARQUE	20235	208	1120	244210	362118	24860	-	551	80264	-	467117
Corpus Christi	20145	711	1471	2037425	462775	231162	-	-	10229	-	231206
Astoria	20145	240	1049	752462	294154	242762	-	-	49165	-	1316708
San Diego	20140	277	2028	1819460	582562	870591	-	1827	8959	-	2869752
Sacramento	20200	266	1216	1262622	425700	232732	-	-	-	-	2625584
Total West Coast			1359	16507600	4496551	3766631	32749	6486	624911	-	2592627
Direct Support Family 20325							2972226	3157234		-	2241560
Indirect Costs										1203591	1203591
Grand Total				16507600	4496551	3766631	2970495	322640	624911	1203591	25472645

Handcraft Report
1988

HHGSA

Air Stations	OPAC	Number of A/C Assigned	FLT HRS	Personnel Cost	Fuel Cost	Maxt C/G 20	A/C Program 83 41	Elect Program 08 42	Share + Other Cost	Actual Cost	TOTAL
Boston	20120	500	2351	2711873	181215	1235976			276815		4455879
Albuquerque	20125	365	1875	1452071	122788	334355			875		1910117
San Antonio	20126	400	2229	1726731	176050	597477			24886		2725344
Miami	20140	875	4416	4312575	349385	1020891		4413	18285		5866347
Birmingham	20235	401	2365	2001051	182294	1513831			42257		4129823
Chaparral Christi	20245	300	1877	1581064	130805	232879			6275		1951083
New Orleans	20250	516	3045	3027499	234709	453949		20634	28849		3770660
San Diego	20270	402	2113	2226762	162870	397962			45764		2833658
Los Angeles	20283	274	1733	1552553	133579	150615		88141	11687		1934575
Phoenix	20285	183	833	883061	64808	176313			1909		1125491
Port Angeles	20170	84	431	471333	37221	104009			16299		654862
Astoria	20195	320	1931	1443089	110301	661351			27188		2241929
North Bend	20276	35	84	155451	6475	6300			1171		169397
Barbers Point	20255	300	1609	1769813	124022	801845		7016	32442		2735138
Kodiak	20200	287	1605	1365584	46633	75703			31581		1519501
TOTAL Air Stations		5132	26570	22940036	2049535	7753766	2899296	2172095	1156703	1932829	28029754
Direct Support Facility											
Actual Costs		5132	26570	22940036	2049535	7753766	2899296	2172095	1156703	1932829	28029754
Grand Total											

HM 25

Air Plant Report
FY 88

Air Stations	OFFIC	Number of H/C ISSUED	FLT HMS	Personnel Cost	Fuel OC 30	Minut OC 30	AP Hourly Cost	Alloc Program OC 40	Share + Other Cost	Indirect Cost	TOTAL
Cape Cod	20115	598	5878	4913627	437700	770420		5850	11604		6738081
Miami	20140	791	5784	4488388	1398571	1018360			249587		7161256
Corpus Christi	20245	278	2097	1712819	507035	286801			7070		2514345
San Diego	20170	248	2093	1847042	506087	359785			45864		2808918
San Clemente	20290	144	892	1927982	215686	123374			172		1369214
Astoria	20195	245	1113	1277284	249123	28477		5850	21362		1586292
		8354	15857	5321578	3834222	2827887	7756187	96552	440959		22730496
TOTAL Air Stations										4315293	30052739
Direct Support Facility											
Indirect Costs											
GRAND TOTAL		239	15857	5321578	3834222	2827887	7756187	102402	440959	7295293	4718503

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12/02/83.

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1983

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES		OPERATING MAINTENANCE COSTS		ELECTRONICS PROGRAM	VESSEL PROGRAM	OTHER COSTS	\$ TOTAL
			\$ OFFICERS	\$ ENLISTED	\$ FUEL	\$ ALL OTHER				
....	WMEC 230									
13	STORIS	12701								
17	STORIS	12701	279,750	1,125,838	223,237	436,495	9,077	220,775		2,295,172
....	WMEC 213									
05	ESCAPE	12120				344		25,534		25,578
07	ESCAPE	12120	284,092	1,186,121	436,472	271,223	45,434	686,617		2,889,959
08	ACUSHNET	12201	286,957	1,171,414	150,384	354,009	119,219	834,926		2,916,909
13	YOCONA	12202	185,111	705,562	138,579	238,577	55,213	297,055	5,517	1,625,614
17	YOCONA	12202	27,085	81,675	17,755	2,154	368	169		129,206
....	TOTAL FOR WMEC 213		783,245	3,144,772	743,190	866,307	220,234	1,824,301	5,517	7,967,566
....	AVERAGE 3 VESSELS		261,082	1,048,257	247,730	288,769	73,411	608,100	1,839	2,529,189
....	WMEC 210									
01	ACTIVE	12104						252,501		1,946,775
01	VIGILANT	12103	229,916	855,321	260,450	344,823	3,764	207,582		2,044,918
01	DECISIVE	12115	279,209	1,069,717	153,129	323,651	11,630	11,667		52,402
03	ALERT	12116			4,879	35,656				772,318
03	VIGOROUS	12110		81,821	199,294	264,976	61,008	165,219		913,937
07	DAUNTLESS	12113	284,868	148,227	243,860	239,035	69,924	212,951		2,117,081
07	STEADFAST	12109	317,137	1,073,472	274,918	234,518	10,051	861,661		2,771,757
07	COURAGEOUS	12108	295,924	1,080,285	314,305	283,756	23,394	642,701		2,640,365
07	DECISIVE	12115	317,069	1,059,045	274,198	273,061	10,550	648,007		2,581,930
07	DILIGENCE	12102	263,739	1,079,953	270,269	295,267	6,086	375,589		2,310,903
07	RELiance	12101	261,536	868,791	223,269	250,995	19,972	76,001		1,700,564
08	DURABLE	12114	285,320	908,813	277,224	335,701	5,070	491,500		2,303,628
08	VALIANT	12107	312,786	1,077,710	226,855	310,721	1,263	373,978		2,302,924
08	DEPENDABLE	12112	313,039	1,081,763	29,056	420,841	8,247	178,945		1,973,579
11	VENTUROUS	12111	313,461	996,004	258,576	500,603	22,069	258,567		2,349,280
13	RESOLUTE	12106	327,685	1,044,871	228,516	263,929	62,416	153,294		2,080,711
13	CONFIDENCE	12105	20,690	66,373	565	8,300		1,530	702	98,160
17	CONFIDENCE	12105	252,495	923,019	184,953	516,933	21,521	488,085		2,384,006
60	VIGOROUS	12113	297,058	878,628						1,175,684
77	ALERT	12116	288,806	890,570				470,000		1,649,376
....	TOTAL FOR WMEC 210		4,680,744	16,168,601	3,574,781	5,128,608	351,754	6,265,168	702	36,170,358
....	AVERAGE 16 VESSELS		292,547	1,010,538	223,424	320,538	21,985	391,573	44	2,260,647
....	WMEC 270									
05	TAMPA	11502								3,481
05	BEAR	11501	258,707	1,029,346	132,840	207,241	3,885	33,034		1,665,053
....	TOTAL FOR WMEC 270		258,707	1,030,376	132,915	209,564	3,938	33,034		1,668,534
....	AVERAGE 2 VESSELS		129,354	515,188	66,458	104,782	1,969	16,517		834,267

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1984

PAGE 3

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES \$ OFFICERS	\$ ENLISTED	MAINTENANCE COSTS FUEL \$ ALL OTHER	ELECTRONICS \$ PROGRAM	VESSEL \$ PROGRAM	OTHER \$ COSTS	\$ TOTAL
****	WMEC 230								
13	STORIS	12701		66,756					66,756
17	STORIS	12701	288,627	1,196,244	178,284	41,406	755,474		2,761,117
****	WMEC 213								
07	ESCAPE	12120	304,021	1,167,513	248,169	353,848	368,904	6,212	2,498,404
08	ACUSHNET	12701	239,239	1,238,190	213,044	272,620	331,373	35,373	2,412,838
13	YOCONA	12202		57,376	827-	45,444	21,763		125,842
17	YOCONA	12202	345,608	1,249,318	181,932	267,358	55,540		2,166,281
****	TOTAL FOR WMEC 213		888,888	3,712,397	643,338	939,270	777,580	41,585	7,203,485
****	AVERAGE 3 VESSELS		296,289	1,237,466	214,446	313,090	259,193	13,862	2,401,155
****	WMEC 210								
01	ACTIVE	12104	251,161	989,222	198,689	246,982	102,060		1,807,842
01	VIGILANT	12103	292,116	1,182,639	239,047	258,829	361,244	1,511	2,387,506
03	ALERT	12116		98,743	284,189	269,553	57,897	17,407	761,718
03	VIGOROUS	12113		106,970	205,476	227,338	303,530	10,913	858,548
07	DECISIVE	12115	300,886	992,200	278,812	248,585	92,137	2,356	1,926,787
07	DAUNTLESS	12110	270,529	1,063,546	217,795	215,198	221,144	23,263	2,016,071
07	STEADFAST	12109	322,088	1,131,047	162,419	269,884	1,112,982	4,141	3,018,482
07	COURAGEOUS	12108	281,544	933,155	227,912	284,397	394,523	18,278-	2,180,885
07	DILIGENCE	12102	286,689	956,302	99,501	292,526	410,665	12,765	2,080,307
07	RELIANT	12101	339,339	1,162,857	346,230	286,269	582,765	2,741,408	2,741,408
08	VALIANT	12107	230,908	968,110	256,334	304,163	86,110	11,004	1,872,414
08	DEPENDABLE	12112	205,943	865,999	271,235	295,804	124,812	15,304	1,786,812
08	DURABLE	12114	284,723	1,083,564	220,988	317,524	363,089	3,455	2,288,246
11	VENTUROUS	12111	238,925	765,904	157,804	371,394	596,988	348,501	2,504,970
13	RESOLUTE	12106	315,474	1,016,840	204,618	308,050	351,072	10,187	2,218,187
13	CONFIDENCE	12105	232,273	831,596	253,531	276,990	431,893	4,386	2,033,988
17	CONFIDENCE	12105				168,976	2,477-		168,976
60	VIGOROUS	12113	283,880	923,487				1,207,487	1,207,487
77	ALERT	12116	318,894	894,489				1,213,383	1,213,383
****	TOTAL FOR WMEC 210		4,465,572	15,967,670	3,625,980	4,642,462	5,580,434	443,825	36,080,058
****	AVERAGE 16 VESSELS		279,098	997,978	226,589	290,154	349,402	27,745	2,182,504
****	WMEC 270								
05	NORFOLK	11504		19,889	38,143	65,665		8,404	132,888
05	HARRIET LANE	11503		76,608	131,496	89,357	9,128		310,391
05	TAMPA	11502	332,405	1,373,511	182,398	223,780	9,025		2,124,165
05	BEAR	11501	358,405	1,539,288	166,702	336,840	75,321		2,486,085
****	TOTAL FOR WMEC 270		690,810	3,009,286	518,739	715,642	93,474	8,404	5,063,228
****	AVERAGE 4 VESSELS		172,703	752,324	129,685	178,911	23,369	2,101	1,265,807

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05/14/86
OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1985

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES \$ OFFICERS	\$ ENLISTED	OPERATING MAINTENANCE COSTS FUEL \$ ALL OTHER	ELECTRONICS \$ PROGRAM	VESSEL \$ PROGRAM	OTHER \$ COSTS	\$ TOTAL
....	WMEC 230								
17	STORIS	12701	403,971	1,262,647	294,756	205,266	21,240	7,469	2,195,349
....	WMEC 213								
07	ESCAPE	12120	307,896	1,104,511	93,432	405,723	42,338	3,189,658	5,143,523
08	ACUSHNET	12201	222,891	877,863	196,076	308,926	8,943	844,968	2,459,547
13	YOCONO	12202		13,688-		2,728		7,423	3,537-
17	YOCONO	12202	338,865	1,330,126	118,241	284,464	101,008	402,739	2,575,439
....	TOTAL FOR WMEC 213		869,652	3,288,812	407,749	1,001,841	152,289	4,444,784	10,174,972
....	AVERAGE 3 VESSELS		289,884	1,099,604	135,916	333,947	50,763	1,481,595	3,391,657
....	WMEC 210								
01	ACTIVE	12104		828			4,583		5,411
01	VIGILANT	12103	355,315	1,117,020	133,501	425,330	60,728	513,320	2,603,897
03	ALERT	12116	91,626	253,484	238,088	347,358	2,815	136,412	1,069,783
03	VIGOROUS	12112	367,414	1,158,638	169,818	318,976	1,507	181,597	2,195,921
07	DECISIVE	12115	304,999	896,341	224,212	182,682	5,273	120,027	1,833,610
07	DAUNTLESS	12110	331,883	1,008,341	307,344	162,651	4,409	29,455	1,843,098
07	STEADFAST	12109	311,672	1,007,706	361,490	276,330	45,438	163,445	2,166,081
07	COURAGEOUS	12108	308,456	1,126,567	320,833	231,209	87,849	473,248	2,545,163
07	DILIGENCE	12102	321,558	1,100,310	286,852	282,063	2,373	303,348	2,296,504
07	RELIANCE	12101	298,638	1,036,722	310,183	295,096	1,863	28,719	1,972,168
08	VALIANT	12107	337,751	1,066,390	254,485	298,219	4,275	401,314	2,362,434
08	DURABLE	12114	321,007	1,117,287	319,061	379,725	4,000	11,648	2,152,728
08	DEPENDABLE	12112	353,888	1,161,572	240,810	317,724	6,030	805,220	2,885,528
11	VENTURUS	12111	375,955	1,094,339	193,755	336,365	134,194	238,869	2,373,360
13	RESOLUTE	12108	336,879	1,052,826	227,502	196,647	4,225	311,686	2,130,686
13	CONFIDENCE	12105	337,959	1,027,068	192,717	161,220	16,464	269,320	2,004,802
17	CONFIDENCE	12105				15,091	287	5,889	21,267
77	ALERT	12116	194,712	674,093					868,805
....	TOTAL FOR WMEC 210		4,846,712	15,999,532	3,780,661	4,226,886	386,313	3,994,616	33,331,218
....	AVERAGE 16 VESSELS		309,170	999,971	236,291	264,180	24,145	249,657	2,083,201
....	WMEC 270								
01	SPENCER	11505		1,154					1,154
05	NORTHLAND	11504	415,964	1,541,916	61,173	294,974	1,140	16,291	2,332,426
05	HARRIET LANE	11503	457,613	1,418,362	85,891	390,132	1,353	48,562	2,401,895
05	TAMPA	11502	426,232	1,441,855	219,455	412,177	3,946	119,042	2,622,707
05	BEAR	11501	303,530	1,391,439	445,425	452,409	40,374	419,597	3,052,774
....	TOTAL FOR WMEC 270		1,604,339	5,794,726	811,944	1,549,692	46,813	603,492	10,410,956
....	AVERAGE 5 VESSELS		320,868	1,158,945	162,389	309,938	9,363	120,698	2,082,191

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1986

PAGE 3

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES		OPERATING			ELECTRONICS \$ PROGRAM	VESSEL \$ PROGRAM	OTHER \$ COSTS	\$ TOTAL
			\$ OFFICERS	\$ ENLISTED	\$ FUEL	\$ ALL OTHER	\$ PROGRAM				
....	WMEC 230										
17	WMEC STORIS	12701	321,231	1,018,403	13,288	89,926	3,775-		37,395		1,476,468
....	WMEC 213										
07	ESCAPE	12120	358,097	1,329,922	132,669	439,107	477		350,096		2,610,368
08	ACUSHNET	12201	310,075	1,271,506	165,169	356,542			172,512		2,275,804
17	YOCOMO	12202	306,142	1,269,822	124,481	469,761	32,210		210,998		2,413,014
....	TOTAL FOR WMEC 213		974,314	3,871,250	422,319	1,265,410	32,687		733,206		7,299,186
....	AVERAGE 3 VESSELS		324,771	1,290,417	140,773	421,803	10,896		244,402		2,433,062
....	WMEC 210										
01	VIGILANT	12103	412,562	1,381,425	132,229	366,407	29,780		131,737		2,454,140
03	ALERT	12116	334,048	1,222,893	186,578	432,410	15,959		579,751		2,771,639
03	VIGOROUS	12113	378,176	1,214,066	161,939	247,871	5,882		398,824		2,406,758
07	DAUNTLESS	12110	411,202	1,231,829	205,750	358,050	50		566,297		2,773,178
07	STEADFAST	12109	378,930	1,295,059	171,925	322,775	1,036		521,181		2,690,906
07	COURAGEOUS	12108	373,691	1,254,219	235,075	353,203	1,484		52,780		2,270,462
07	DECISIVE	12115	368,990	1,261,455	224,289	368,078	270		666,969		2,889,671
07	DILIGENCE	12102	365,842	1,333,255	224,331	402,125	229		125,496		2,451,278
07	RELIANCE	12101	374,441	1,370,415	117,041	270,229	3,527		150,149		2,285,802
08	DURABLE	12114	385,026	1,359,999	207,847	349,422	5,808		732,855		3,041,057
08	VALIANT	12107	366,525	1,255,554	153,599	365,607			734,559		2,875,844
08	DEPENDABLE	12112	379,453	1,313,404	199,571	371,253	6,603		263,008		2,533,293
11	VENTUROUS	12111	419,453	1,243,122	142,397	178,067	12,958		398,286	506	2,395,799
13	RESOLUTE	12106	343,563	1,141,377	139,965	336,524	15,744		184,271		2,171,444
13	CONFIDENCE	12105	329,062	1,120,910	178,137	321,415	2,040		58,161		2,010,725
....	TOTAL FOR WMEC 210		5,620,964	18,898,982	2,680,673	5,044,436	101,370		5,975,065	506	38,021,986
....	AVERAGE 15 VESSELS		374,731	1,266,599	178,712	336,296	6,758		371,671	34	2,534,800
....	WMEC 270										
01	.....	11508		8,733							8,733
01	WMEC ESCANABA	11507	15,953	37,060							53,013
01	WMEC SENECA	11506	118,275	160,037		19,541			59,100		400,841
01	WMEC SPENSER	11505	299,434	1,187,370	59,902	188,381	60,398		64,119		1,859,604
05	WMEC NORTHLAND	11504	516,242	1,620,675	198,078	547,840	184,451		133,083		3,200,379
05	WMEC HARET LANE	11503	504,436	1,793,761	340,212	618,813	110,821		318,741		3,686,784
05	WMEC TAMPA	11502	540,377	1,734,788	550,850	765,978	116,382		367,950		4,076,925
05	WMEC BEAR	11501	476,795	1,623,421	823,494	695,758	65,635		292,497		3,977,600
....	TOTAL FOR WMEC 270		2,471,512	8,165,845	2,017,424	2,836,311	537,687		1,235,100		17,263,879
....	AVERAGE 8 VESSELS		308,939	1,020,731	252,176	354,539	67,211		154,388		2,157,985

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1986

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES		ENLISTED	MAINTENANCE COSTS	OPERATING		ELECTRONICS	VESSEL	OTHER	TOTAL
			OFFICERS	\$			FUEL	\$ ALL OTHER					$ PROGRAM	$ PROGRAM	$ COSTS	$
07	OCRACOE	13407	20,941		43,959		10,823	2,515				78,238
07	MUNIVAK	13406	26,762		92,238		5,470	19,596				144,066
07	MONHEGAN	13405	20,655		88,949		11,790	8,521				129,915
07	MAUI	13404	25,223		140,381		22,654	18,675		1,565		208,498
07	MATAGORDA	13403	40,402		126,841		26,037	14,199		1,365		208,844
07	MANITOU	13402	43,720		150,175		60,262	25,828		2,154		282,139
07	FARALLON	13401	60,102		181,587		40,045	25,920		1,454		309,108
***	TOTAL FOR WFR 110		263,950		898,465		187,227	119,226		6,538		1,475,406
***	AVERAGE R VESSELS		32,994		112,708		23,403	14,903		817		184,426

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07 WPR VASHIN

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH FISCAL YEAR 1987

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DIST	VESSEL	OPTAC	MILITARY PAY AND ALLOWANCES		OPERATING MAINTENANCE COSTS		ELECTRONICS PROGRAM	VESSEL PROGRAM	OTHER COSTS	\$ TOTAL
			\$ OFFICERS	\$ ENLISTED	\$ FUEL	\$ ALL OTHER				
....	WMFC 270									
11	WMFC STORIS	12701	346,018	1,455,752	85,715	315,286	45,346	77,586	2,557	2,324,260
....	WMFC 210									
01	ESCAPE	12120	335,492	1,479,733	161,651	539,067	27,366	931,668		3,474,977
01	ACOUSINT	12201	327,821	1,391,216	154,121	359,622	11,118	368,244		2,612,142
11	YOCOMD	12202	363,627	1,522,501	131,324	270,814	81,789	69,687		2,447,742
....	TOTAL FOR WMFC 210		1,026,940	4,293,450	447,036	1,177,503	120,273	1,369,599		8,534,861
....	AVERAGE 7 VESSELS		342,313	1,464,483	149,032	392,501	40,091	456,533		2,844,954
....	WMFC 210									
01	ALERT	12116	376,237	1,292,317	141,595	281,446	18,712	141,284		2,251,591
01	DILIGENCE	12102	401,877	1,538,560	465,659	411,347	62,893	593,269		3,173,605
01	VIGILANT	12103	386,898	1,431,778	131,752	333,511	5,578	352,781		2,642,298
01	VALIANT	12107	365,117	1,393,205	108,793	282,876	34,810	43,339		2,228,141
01	DECISIVE	12115	388,671	1,317,899	193,510	352,152	36,461	373,814		2,662,507
01	DEPENDABLE	12112	388,980	1,400,000	130,001	286,661	20,939	475,559		2,702,140
01	VIGOROUS	12113	374,807	1,242,329	219,922	245,112	979	375,377		2,408,526
01	STEADFAST	12109	387,603	1,365,998	246,582	394,885	28,154	597,009		3,020,231
01	DAUNTLESS	12110	436,784	1,378,257	240,652	389,381	23,206	699,348		3,167,628
07	COURAGEOUS	12108	161,743	603,114	217,105	121,595	36,647	113,738		1,182,724
01	RELIANT	12101	234,729	825,831	148,828	299,301	23,152	113,738	876	1,646,455
08	DURABLE	12114	1,710	46,651	24,589	49,016	2,917	3,235		128,118
11	VENTUROUS	12111	379,049	1,257,054	177,672	365,727	56,518	202,632		2,438,652
11	ACTIVE	12104	222,044	878,869	90,062	128,606	4,532	40,419		1,364,532
11	RESOLUTE	12106	389,140	1,224,995	100,484	323,266	5,739	523,967	243	2,567,835
13	CONFIDENCE	12105	120,039	427,211	27,509	185,526		27,973		788,258
17	CONFIDENCE	12105				176				176
....	TOTAL FOR WMFC 210		5,015,434	17,624,070	2,299,124	4,546,094	337,185	4,550,391	1,119	34,373,417
....	AVERAGE 10 VESSELS		313,465	1,101,504	143,695	283,131	21,074	284,399	70	2,148,339
....	WMFC 270									
01	WMFC BEAR	11501	492,388	1,788,623	325,041	919,743	141,420	679,357	753	4,347,325
01	WMFC TAMPA	11502	492,864	1,791,568	271,407	697,071	209,272	335,738	753	3,798,673
01	WMFC HARET LANE	11503	489,709	1,668,714	354,003	670,873	146,970	62,500	753	3,393,522
01	WMFC FORTLAND	11504	511,918	1,759,754	309,844	861,592	207,312	420,713	753	4,071,890
01	WMFC SPENSER	11505	524,780	1,711,015	216,602	529,449	13,112	174,924		3,169,882
01	WMFC SENECA	11506	471,676	1,581,843	126,622	592,773	10,042	143,557		2,929,473
01	WMFC ESCANABA	11507	404,331	1,100,946	111,324	311,217	4,000	59,993		1,991,811
01	TAHOHA	11508	124,733	376,139	24,500	81,475				606,847
01	.....	11509	40,315	147,474						187,749
11	.....	11510	4,620	1,043						6,563
....	TOTAL FOR WMFC 270		3,557,294	11,930,983	1,739,343	4,664,193	732,128	1,876,782	3,012	24,503,735
....	AVERAGE 10 VESSELS		355,729	1,193,098	173,934	466,419	73,213	187,678	301	2,450,374

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1987

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES		OPERATING MAINTENANCE COSTS		ELECTRONICS PROGRAM	VESSEL PROGRAM	OTHER COSTS	\$ TOTAL
			\$ OFFICERS	\$ ENLISTED	\$ FUEL	\$ ALL OTHER				
****	WPR 110 CLASS									
01	SANIREL	13412	57,569	213,805	63,547	64,085	9,811	2,500		411,317
03	MATINICUS	13415	44,505	148,679	21,385	28,116				242,685
07	NANTUCKET	13416	21,656	81,895	25,683	6,986		376		136,596
07	FARALLON	13401	89,335	290,051	97,770	47,705		20,840		545,701
07	MANITOU	13402	78,157	283,171	169,476	49,921		6,830		587,555
07	MATAGORDA	13403	87,723	302,197	94,886	48,205		40,030		573,041
07	MAUI	13404	74,516	303,813	143,743	48,848	30	4,159		575,109
07	MONIEGAN	13405	63,379	258,252	175,495	63,938		14,250		575,314
07	MUNIVAK	13406	71,559	260,006	214,672	76,941		399		623,577
07	OCRACOE	13407	63,165	261,654	107,299	59,238		450		491,806
07	WPR VASHIN	13418	73,604	255,973	134,065	54,894		690		519,226
11	EDISTO	13413	50,306	161,618	59,789	47,569		673		319,955
11	SAPELO	13414	16,754	60,370						77,124
12	SAPELO	13414	30,964	78,973	46,092	35,483	2,992	671		195,175
17	WPR MUSTANG	13410	79,386	333,659	66,680	79,464	14,048	41,561	1,200	615,998
17	WPR NAUSHON	13411	88,139	345,791	62,887	80,773	2,979	5,887		586,456
****	TOTAL FOR WPR 110		990,717	3,639,907	1,483,469	792,166	29,860	139,316	1,200	7,076,635
****	AVERAGE 15 VESSELS		66,048	242,660	98,898	52,811	1,991	9,288	80	471,776

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1988

PAGE 3

DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES \$ OFFICERS	ENLISTED \$	MAINTENANCE COSTS \$ FUEL \$ ALL OTHER	ELECTRONICS \$ PROGRAM	VESSEL \$ PROGRAM	OTHER \$ COSTS	\$ TOTAL
****	WMEC 230								
11	WMEC STORIS	12701	364,841	1,485,205	74,971	213,769	14,761	271,552	2,435,199
****	WMEC 213								
01	ACUSHNET	12201	326,387	1,416,920	145,752	470,476	3,644	348,679	2,713,058
01	ESCAPE	12120	346,179	1,407,063	60,915	390,281	11,506	324,733	2,540,677
11	YOCONO	12202	383,379	1,570,170	146,458	223,422	7,661	413,359	2,763,449
****	TOTAL FOR WMEC 213		1,065,945	4,403,153	353,125	1,084,179	22,811	1,087,971	8,017,184
****	AVERAGE 3 VESSELS		355,315	1,467,718	117,708	361,393	7,604	362,657	2,672,395
****	WMEC 210								
01	ALERT	12116	379,180	1,268,166	109,706	313,150	615	393,247	2,464,064
01	DECISIVE	12115	408,910	1,438,045	84,356	336,010	6,252	43,130	2,326,703
01	DURABLE	12114	111,288	424,054		18,831			516,511
01	VIGOROUS	12113	363,327	1,207,267	24,490	283,950	87	134,716	2,013,837
01	DEPENDABLE	12112	378,657	1,401,410	138,191	252,728	306	28,993	2,200,285
01	DAUNTLESS	12110	415,093	1,372,034	189,704	189,623	11,040	21,866	2,199,360
01	STEADFAST	12108	414,931	1,486,320	98,112	295,791	7,005	84,452	2,397,784
01	VALIANT	12107	396,021	1,453,708	166,369	329,078	6,195	220,057	2,571,428
01	CONFIDENCE	12105	142,691	533,478	32,762	32,762			717,913
01	VIGILANT	12103	426,801	1,599,117	144,260	243,768	8,171	334,357	2,756,474
01	DILIGENCE	12102	413,006	1,375,898	78,358	432,974	2,085	941,357	2,643,678
07	RELiance	12101			15,422	6,524	10,877		1,978
07	COURAGEOUS	12108	4,101	16,445	10,065	14,985			25,466
11	VENTUROUS	12111	412,608	1,378,386	97,843	230,472	287	548,244	2,668,590
11	ACTIVE	12104	375,356	1,347,133	126,781	193,116	7,006	252,223	2,296,615
11	RESOLUTE	12106	385,806	1,365,833	104,732	202,719	30,954	398,660	2,489,804
32	RELiance	12101							
32	COURAGEOUS	12108		1,699					1,699
****	TOTAL FOR WMEC 210		5,027,776	17,669,093	1,357,397	3,338,819	75,003	3,023,179	30,492,200
****	AVERAGE 16 VESSELS		314,236	1,104,318	84,837	208,676	4,688	188,849	1,905,763
****	WMEC 270								
01	PHETIS	11511	12,100	32,874				10,000	44,974
01	CAMPBELL	11510	310,265	803,233	12,148	7,535			1,143,181
01	TAMHAW	11509	349,180	1,447,893	27,043	608,070			2,432,186
01	WMEC ESCANABA	11508	392,699	1,229,773	114,842	696,637		54,993	2,486,944
01	WMEC SENECA	11507	521,999	1,594,483	211,950	683,176		26,824	3,038,432
01	WMEC SPENSER	11506	536,057	1,778,329	215,881	770,502		51,835	3,354,390
01	WMEC NORTHLAND	11505	512,660	1,760,181	234,934	631,013		358,316	3,500,695
01	WMEC HARET LANE	11504	509,210	1,827,506	217,548	574,961		21,545	3,227,518
01	WMEC TAMPA	11503	513,071	1,698,754	640,217	765,632		284,840	3,937,126
01	WMEC BEAR	11502	505,028	1,801,708	202,412	532,342		105,220	3,155,933
11	RELiance	11501	521,378	1,791,096	294,932	627,769		662,949	3,903,552
11	WMEC BEAR	11511	19,840	44,975					64,815
11	RELiance	11513		3,036					3,036
11	WMEC BEAR	11512	2,878						2,878

32	.....	11511	231 654		644 444		26,731	644 444	26,731
....	TOTAL FOR WMEC 270		4,706,362	15,813,841	2,171,907	5,924,368	121,388	1,586,522	30,324,388
....	AVERAGE 13 VESSELS		362,028	1,216,449	167,070	455,721	9,338	122,040	2,332,645

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OPERATING COSTS OF COAST GUARD CUTTERS
BY CLASS OF UNIT AND MAJOR ITEMS OF COST
4TH QTR FISCAL YEAR 1988

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DIST	VESSEL	OPFAC	MILITARY PAY AND ALLOWANCES		OPERATING MAINTENANCE COSTS		ELECTRONICS PROGRAM	VESSEL PROGRAM	OTHER COSTS	\$ TOTAL
			\$ OFFICERS	\$ ENLISTED	\$ FUEL	\$ ALL OTHER				
****	WPB 110 CLASS									
01	*****	13426		4,728						4,728
01	SANIBEL	13412	73,577	275,030	72,166	67,258		19,018		507,049
05	MATINICUS	13415	78,133	305,903	52,532	90,732		187,900		715,200
07	ATTU	13417	41,043	155,760	56,131	29,446				282,380
07	NANTUCKET	13416	70,189	268,218	83,048	38,947				460,402
07	WPB VASHIN	13408	80,617	281,665	57,766	37,863				467,911
07	OCRACOE	13407	69,721	281,857	80,693	61,267		6,060		499,598
07	MUNIVAK	13406	81,062	283,982	107,214	39,761		79,630		591,649
07	MONHEGAN	13405	67,652	232,130	65,035	38,520		151,890		575,227
07	MAUI	13404	84,375	261,561	71,017	42,361		5,518		464,532
07	MATAGORDA	13403	75,828	272,074	47,835	29,871		4,808		425,608
07	MANITOU	13402	73,202	289,808	88,304	42,942				498,064
07	FARALLON	13401	326,808	280,017	36,480	31,012		213,061		887,379
07	*****	13425	10,064	5,822						15,886
07	*****	13424	11,302	40,164						51,466
07	*****	13423	20,323	53,458						73,781
07	CHANDELEUR	13419	44,303	131,508	8,155	22,388				206,354
07	BARANOF	13418	66,434	169,344	20,415	21,675				277,868
08	*****	13420	34,690	126,358	20,179	22,989				204,216
08	*****	13421	33,083	104,061	12,707	16,026				165,877
08	WPB NAUSHON	13411	107,316	402,422	50,978	80,356	1,367	10,343		652,782
11	EDIISTO	13413	76,542	350,378	13,672	60,751		144,876		646,218
11	SAPELO	13414	70,439	305,105	6,909	133,791		55,568		571,812
13	*****	13422	17,672	45,845	7,700	12,932				84,149
17	WPB MUSTANG	13410	93,376	368,618	42,317	122,554	2,907	3,542		633,314
33	CHANDELEUR	13419						3,989		3,989
****	TOTAL FOR WPB 110		1,707,452	5,325,816	1,001,253	1,043,442	4,274	886,203		9,968,440
****	AVERAGE 25 VESSELS		68,298	213,033	40,050	41,738	171	35,448		388,738

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O P E R A T I O N A L S T A T I S T I C S

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A I R C R A F T

ANNUAL EMPLOYMENT SUMMARY
FISCAL YR 1984 ABSTRACT OF OPERATIONS FISCAL YR 1984

COAST GUARD TYPE TOTALS

HU25A

	MSSNS	SORT	RRH-----		SBOH	SBRH	EMPHRS	--READINESS---	
			DAY	DUTY				HIGH	OTHER
CVS	1	1	2					2	740
RBS									
SAR	1214	1338	1563	1700			3357		38703
DOM ICE	23	34	42	24			76		
POLAR OPS	7	7	19	1			23		
MSA	9	11	16	11			41		
ELT FISH D	367	323	600	255			1195		
ELT FISH F	114	57	120	87			410		2900
ELT DRUGS	1174	1332	2323	1426			4592		2900
ELT OTHER	354	365	565	374			1338		
MIL OPS	12	39	51	28			80		
MIL PREP	7	11	12	19			31		
OP TRA	3724	3843	5269	2823			8367		
CADET OC	62	8	10	5			142		
A TO N	22	23	38	14			58		
RAD NAV	1	2	5	2			7		
MER	46	43	60	24			136		
COOP FED	39	52	75	24			108		
COOP STATE	1	1	1				2		
COOP LOCAL									
PIA	73	93	48	69			136		
MISC	110	166	147	113			267		
TEST	272	270	238	96			336		
FERRY	61	81	132	51			186		
PES PORT	6	5	6	1			7		
PES COAST	59	11	34	14			143		
PES OFFSH	122	66	161	68			500		
TOTALS	7880	8182	11537	7229			21540	45243	77623

NOT OPERATIONAL READY HOURS *NOR*

DAY	DUTY	TOTAL
50108	126345	176453

OCCURRENCE		UNABLE TO MEET READINESS REQUIREMENTS		HOURS	
DAY	DUTY	DAY	DUTY	DAY	DUTY
140	218	140	218	1337	1977
TOTAL	358	TOTAL	358	TOTAL	3314

AVG NO A/C ASSIGNED 33.32
 AVG NO SPARE A/C ASSIGNED 2.88
 DAYS AWAY FROM HOME STATION 321

AVG NO A/C ASSIGNED
 AVG NO SP A/C ASSIGNED
 DAYS AWAY HOME STATION
 DAYS DEPL ABOARD SHIP

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ANNUAL EMPLOYMENT SUMMARY
 FISCAL YEAR 1985 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

HU25A

	MISSIONS	SORTIES	LBRH		SHIP OPERATIONS		EMP HOURS	READINESS	
			DAY	DUTY	OP HOURS	RES HOURS		HIGH	OTHER
CVS	1	2	1	1			2	231	CVS
RBS	7	8	9	16			30		RBS
SAR	1389	1553	1562	2156			3779	42016	SAR
DOM ICE	20	22	38	10			70		DOM ICE
POLAR OPS	15	33	42	34			77		POLAR OPS
MSA	9	18	19	30			49		MSA
ELT-FISH-DOM	478	247	462	224			1772	65	ELT-FISH-DOM
ELT-FISH-FOR	384	96	199	150			1440	30	ELT-FISH-FOR
ELT-DRUGS	2094	2294	4173	2746			8027	95	ELT-DRUGS
ELT-OTHER	412	382	568	419			1391		ELT-OTHER
MIL OPS	44	55	51	47			102		MIL OPS
OPTRA PILOTS	3254	3279	4434	2424			7643		OPTRA PILOTS
OPTRA CREW	735	222	465	266			1540		OPTRA CREW
OPTRA-SURFACE	4	2	3	11			6		OPTRA-SURFACE
CADET OC	43	8	49	32			92		CADET OC
A TO N	36	43	49	32			95		A TO N
RAD NAV	1	3	49	32			8		RAD NAV
MER	52	41	54	19			113		MER
COOP FED	45	52	63	51			142		COOP FED
COOP STATE	4	2	6	2			14		COOP STATE
COOP LOCAL	2	1	2	2			4		COOP LOCAL
PIA	80	97	46	87			158		PIA
MISC	98	124	143	108			273		MISC
TEST	285	286	240	115			359		TEST
FERRY	28	36	55	18			93		FERRY
PES	413	22	47	23			1654		PES
TOTALS	9934	8928	12742	9078			28913	42437	TOTALS
								85198	

UNABLE TO MEET
 READINESS REQUIREMENTS
 OCCURRENCES

DAY	270
DUTY	269
TOTAL	539

AVG NO A/C ASSIGNED
 AVG NO SPARE A/C ASSIGNED
 DAYS AWAY FROM HOME STATION
 DAYS DEPLOYED ABOARD SHIP

TOTAL RESOURCE HOURS
 AVG RES HOURS PER A/C

NOT MISSION CAPABLE HOURS

	NMCM		NMCR	
	DAY	DUTY	DAY	DUTY
TOTAL	16111	42456	11691	11012
	17282	39104	28456	157096
	56382	42147		

CARGO SORTIES

LOAD RANGE		VOLUME RANGE	
A	R	A	R
15R	149	543	57
	93		19
	21		2

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1986 AIRCRAFT IN OPERATIONS, FISCAL YEAR

COAST GUARD TYPE TOTALS

H025A

	MISSIONS	SORTIES	SHIP OPERATIONS				READINESS		
			DAY	NIGHT	OP HOURS	RFS HOURS	HIGH	OTHER	
CVS	2	2	2	7					CVS
RBS	1488	1683	1806	2700			46134		RBS
SAR	13	22	25	15					SAR
DOM ICE									DOM ICE
POLAR OPS	9	19	25	36					POLAR OPS
MSA	398	150	303	123					MSA
ELT-FISH-DOM	331	29	64	46					ELT-FISH-DOM
ELT-FISH-FOR	1753	1869	3212	2165			4444		ELT-FISH-FOR
ELT-DRUGS	365	412	617	486			20		ELT-DRUGS
ELT-OTHER	71	103	113	83					ELT-OTHER
MIL OPS	3498	3536	4949	2290					MIL OPS
OPTRA PILOTS	1044	374	801	285					OPTRA PILOTS
OPTRA CREW	7	5	8	1					OPTRA CREW
OPTRA-SURFACE	51	50	69	39					OPTRA-SURFACE
CADET OC	32	27	27	22					CADET OC
A TO N	1	1		2					A TO N
RAD NAV	46	39	61	29					RAD NAV
MER	37	43	43	44					MER
COOP FED	4	6	12	1					COOP FED
COOP STATE	84	104	60	71					COOP STATE
COOP LOCAL	81	145	137	109					COOP LOCAL
PIA	223	233	225	74					PIA
MISC	38	50	58	57					MISC
TEST	335	8	31	16					TEST
FERRY									FERRY
PES									PES
TOTALS	9925	8872	12652	8313			50598	91373	TOTALS

	UNABLE TO MEET READINESS REQUIREMENTS		NOT MISSION CAPABLE HOURS	
	OCCURRENCES	HOURS	NNCM	NNCB
DAY	209	621	14535	10166
DUTY	207	1233	35794	23632
TOTAL	416	1854	50329	33798

AVG NO A/C ASSIGNED	33.13
AVG NO SPARE A/C ASSIGNED	1.40
DAYS AWAY FM HOME STATION	384
DAYS DEPLOYED ABOARD SHIP	
TOTAL RESOURCES HOURS	20965

	NOT MISSION CAPABLE HOURS		CARGO SORTIES	
	NNCM	NNCB	A	B
TOTAL	16551	41202	377	619
DAY	38908	98384		
DUTY	55459	139586		
TOTAL				

	LOAD RANGE		VOLUME RANGE	
	A	B	A	B
	377	196	619	48
				13

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1987 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

HJ25A

	MISSIONS	SORTIES	---LBRH---			---SHIP OPERATIONS---			---READINESS---		
			DAY	DUTY	OP-HOURS	RES-HOURS	EMP-HOURS	HIGH	OTHER		
CVS	6	7	4	5			10			CVS	
RBS	1401	1581	1697	2073			3876	40718		RBS	
DOM ICE	4	4	5	7			13			SAR	
POLAR OPS	3	5	8	5			14			DOM ICE	
MSA	294	77	134	110			819			POLAR OPS	
ELT-FISH-DOM	254	44	111	45			810			MSA	
ELT-FISH-FOR	2521	2915	4865	3195			8868	276		ELT-FISH-DOM	
ELT-DRUGS	419	458	791	409			1457	5		ELT-FISH-FOR	
ELT-OTHER	30	36	49	23			88			ELT-DRUGS	
MIL OPS	2737	2768	3802	1859			6473			ELT-OTHER	
OPTRA PILOTS	620	202	467	160			1255			MIL OPS	
OPTRA CREW	4	2	4				10			OPTRA PILOTS	
OPTRA-SURFACE	70	38	71	35			167			OPTRA CREW	
CADET DC	22	26	24	28			61			OPTRA-SURFACE	
A TO N	1	2		6			6			CADET DC	
RAD NAV	38	48	77	26			113			A TO N	
MEP	43	82	84	66			159			RAD NAV	
COOP FED	2	3	5				5			MEP	
COOP STATE	1	1	1				1			COOP FED	
COOP LOCAL	88	141	74	105			180			COOP STATE	
PIA	69	132	129	62			194			COOP LOCAL	
MISC	205	238	229	96			331			PIA	
TEST	48	68	103	65			171			MISC	
FERRY	125	5	11	4			429			TEST	
PES										FERRY	
TOTALS	9007	8875	12745	8385			25621	40999	92530	PES	
										TOTALS	

UNABLE TO MEET

READINESS REQUIREMENTS

OCCURRENCES

HOURS

DAY

DUTY

TOTAL

AVG NO A/C ASSIGNED

AVG NO SPARE A/C ASSIGNED

DAYS AWAY FM HOME STATION

DAYS DEPLOYED ABOARD SHIP

TOTAL RESOURCE HOURS

AVG RES HOURS PER A/C

NOT MISSION CAPABLE HOURS

NMCM

NMCM

TOTAL

DAY

DUTY

TOTAL

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

CARGO SORTIES

LOAD RANGE

VOLUME RANGE

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

HU25A

	MISSIONS	SORTIES	---(RRH)---		SHIP OPERATIONS---		---READINESS---		
			DAY	DUTY	OP HOURS	RES HOURS	HIGH	OTHER	
CVS	1	1		3					CVS
RBS	2	1		3					RBS
SAR	1003	1130	1171	1442			40220		SAR
DOM ICE									DOM ICE
POLAR OPS	1	2		6					POLAR OPS
MSA	6	11	19	8					MSA
ELT-FISH-DOM	141	104	141	131					ELT-FISH-DOM
ELT-FISH-FOR	122	52	93	73					ELT-FISH-FOR
ELT-DRUGS	1895	2098	3099	2467			397		ELT-DRUGS
ELT-OTHER	354	439	658	438					ELT-OTHER
MIL OPS	50	74	54	86					MIL OPS
OPTRA PILOTS	2812	2751	4080	2005					OPTRA PILOTS
OPTRA CREW	604	271	561	138					OPTRA CREW
OPTRA-SURFACE	2	1	2						OPTRA-SURFACE
CADET OC	66	48	68	27					CADET OC
A TO N	38	26	24	21					A TO N
RAD NAV	61	60	106	68					RAD NAV
WER	42	49	77	26					WER
COOP FED									COOP FED
COOP STATE									COOP STATE
COOP LOCAL									COOP LOCAL
PIA	97	120	80	98					PIA
MISC	47	90	79	68					MISC
TEST	148	148	137	80					TEST
FERRY	30	38	58	24					FERRY
PES	109	1	1	1					PES
TOTALS	7631	7515	10508	7213			40617	61704	TOTALS

UNABLE TO MEET

READINESS REQUIREMENTS
OCCURRENCES

DAY	40
DUTY	221
TOTAL	94
	174

AVG NO A/C ASSIGNED 26 68
AVG NO SPARE A/C ASSIGNED 00
DAYS AWAY FM HOME STATION 754
DAYS DEPLOYED ABOARD SHIP

TOTAL RESOURCE HOURS 17721
AVG RES HOURS PER A/C 664

NOT MISSION CAPABLE HOURS

NMCS	NMCM	NMCB	TOTAL
18650	11086	7545	37483
38879	22771	15345	76793
57529	33857	22890	114276
			DAY
			DUTY
			TOTAL

CARGO SORTIES

LOAD RANGE				VOLUME RANGE			
A	R	C	D	A	B	C	D
483	122	28	8	547	75	16	3
							7

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

H025R

	MISSIONS	SORTIES	CARRIER			SHIP OPERATIONS			EMP-HOURS		---READINESS---	
			DAY	NIGHT	DUTY	OP-HOURS	RES-HOURS	OTHER	HIGH	OTHER		
CVS												
RRS												
SAR	65	73	58		98				158		4044	
DOM ICE												
POLAR OPS	9	16	30		20				50			
MSA	14	10	1		25				36			
ELT-FISH-DOM	5	1	3		140				13			
ELT-FISH-FOR	133	146	218		30				384			
ELT-DRUGS	20	30	39		73				85			
ELT-OTHER	133	125	195		106				314			
MIL OPS	62	52	106		10				158			
OPTRA PILOTS	1	1	2		1				3			
OPTRA CREW												
OPTRA-SURFACE												
CADET OC												
A TO N												
RAD NAV												
HER												
COOP FED	2	2	1						1			
COOP STATE												
COOP LOCAL	9	13	6		10				16			
PIA	3	6	6		10				16			
MISC	15	15	15		7				22			
TEST	3	5	9		8				17			
FERRY	19	1							48			
PES												
TOTALS	494	496	689		432				1326		4044	3654

	UNABLE TO MEET		NOT MISSION CAPABLE HOURS	
	READINESS REQUIREMENTS OCCURRENCES	HOURS	NMCM	NMCR
DAY	1	5	1448	288
DUTY	2	5	1814	532
TOTAL	3	10	3262	820

AVG NO A/C ASSIGNED	2	02
AVG NO SPARE A/C ASSIGNED	00	
DAYS AWAY FM HOME STATION	48	
DAYS DEPLOYED ABOARD SHIP		
TOTAL PERSONNEL HOURS	1121	
AVG PFS HOURS PER A/C	556	

	LOAD RANGE		CARGO SORTIES	
	A	B	A	B
DAY	93	5	99	
DUTY				
TOTAL				

	VOLUME RANGE		TOTAL	
	A	B	A	B
DAY				
DUTY				
TOTAL				

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ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

HMDSG

MISSIONS	SORTIES	DAY	SHIP OPERATIONS			EMP HOURS	READINESS			TOTALS
			DUTY	OP HOURS	RES HOURS		HIGH	OTHER		
CVS										CVS
RBS										RBS
SAR	5	6	8	3		11	2208			SAR
DOM ICE										DOM ICE
POLAR OPS										POLAR OPS
MSA										MSA
ELT-FISH DOM	211	266	269	388		659	138			ELT-FISH-DOM
ELT-FISH-FOR										ELT-FISH-FOR
ELT DRUGS	1	3		5		5				ELT-DRUGS
ELT-OTHER	4	5	4	2		7				ELT-OTHER
MIL OPS										MIL OPS
OPTRA PILOTS	73	67	73	27		174				OPTRA PILOTS
OPTRA CREW	53	9	36	21		121				OPTRA CREW
OPTRA-SURFACE										OPTRA-SURFACE
CADET OC	2	1	1	1		4				CADET OC
A TO N										A TO N
RAD NAV										RAD NAV
MER	1		1			1				MER
COOP FED										COOP FED
COOP STATE										COOP STATE
COOP LOCAL										COOP LOCAL
PIA	1	1	1			1				PIA
MISC	12	19	11	17		28				MISC
TEST	6	6	3	3		6				TEST
FERRY	3	3	5	2		7				FERRY
PES										PES
TOTALS	372	386	412	469		1024	2346	4200		TOTALS

UNABLE TO MEET
READINESS REQUIREMENTS
OCCURRENCES

DAY	UNABLE TO MEET READINESS REQUIREMENTS OCCURRENCES	HOURS
DAY		
DUTY		
TOTAL		

AVG NO A/C ASSIGNED 1.31
AVG NO SPARE A/C ASSIGNED 00
DAYS AWAY FM HOME STATION 99
DAYS EMPLOYED ABOARD SHIP

TOTAL RESOURCE HOURS 881
AVG RFS HOURS PER A/C 673

NOT MISSION CAPABLE HOURS

MMCS	NMCM	NMCB	TOTAL
55	1796	23	1874
27	2243	12	2282
82	4039	35	4156
			DAY
			DUTY
			TOTAL

CARGO SORTIES

LOAD RANGE					VOLUME RANGE				
A	B	C	D	E	A	B	C	D	E
5	2				7				

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1985 ABSTRACT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

11065A

	MISSIONS	SORTIES	DAY	IRRH	DUTY	OP HOURS	SHIP OPERATIONS	RES HOURS	EMP HOURS	---READINESS---	OTHER
CVS											
RBS											
SAR	52	64	45		58				104	569	
DOM ICE											
POLAR OPS											
MSA											
ELT-FISH-DOM											
ELT-FISH-FOR											
ELT-DRUGS											
ELT-OTHER											
MIL OPS	19	21	4		32				36		
OPTRA PILOTS	653	673	1016		121				1358		
OPTRA CREW	76	72	78		48				136		
OPTRA-SURFACE	23	45	41		19		343		83		
CADET OC	4								7		
A TO N	1	2	6						6		
RAD NAV	7	8	6		7				10		
MEP	2	4	4		1				5		
COOP FED											
COOP STATE	1		1						1		
COOP LOCAL	2	2	2						2		
PIA	1	1	2						2		
MISC	183	215	104		38				143		
TEST	19	37	43		29				72		
FERRY											
PES											
TOTALS	1043	1144	1354		569		343		1965	569	7481

UNABLE TO MEET	
READINESS REQUIREMENTS	
OCCURRENCES	HOURS
DAY	4
DUTY	4
TOTAL	8

Avg NO A/C ASSIGNED	3.40
Avg NO SPARE A/C ASSIGNED	0.1
DAYS AWAY FM HOME STATION	5.1
DAYS DEPLOYED AWAYD SHIP	

NOT MISSION CAPABLE HOURS	
NMCS	NMCM
1186	3385
3295	11574
4481	14959
TOTAL	20283

CARGO SORTIES

DAY	4943
DUTY	15340
TOTAL	20283

LOAD RANGE	
A	B
C	D
E	F

VOLUME RANGE	
A	B
C	D
E	F

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1986 AIRCRAFT OF OPERATIONS FISCAL YEAR

COAST GUARD TYPE TOTALS

1465A

	MISSIONS	SORTIES	---LRRH---		SHIP OPERATIONS		EMP HOURS	---READINESS---		OTHER
			DAY	DUTY	OP HOURS	RES HOURS		HIGH	OTHER	
CVS	2	3	6	1435	87	20	2405	29883		CVS
RBS	1164	1379	926							RBS
SAR										SAR
DUM ICE										DUM ICE
POLAR OPS										POLAR OPS
MSA										MSA
ELT-FISH-DOM	3	3	4				7			ELT-FISH-DOM
ELT-FISH FOR	2	2	327	286	1448	375	1095			ELT-FISH FOR
ELT-DRUGS	491	503	134	105	1576	283	601	266		ELT-DRUGS
ELT-OTHER	291	322	14	3			19			ELT-OTHER
MIL OPS	8	9	14							MIL OPS
OPTRA PILOTS	3082	3106	4101	1616	23	24	6111			OPTRA PILOTS
OPTRA CREW	751	643	788	184		11	1349			OPTRA CREW
OPTRA-SURFACE	99	120	96	40	48	35	205			OPTRA-SURFACE
CADET OC	11	2	7	1			23			CADET OC
A TO N	28	43	53	11		4	68			A TO N
RAD NAV	4	10	15	2			17			RAD NAV
MER	55	42	53	22			84			MER
COOP FEU	75	83	72	45			121			COOP FEU
COOP STATE	10	13	9	8			18			COOP STATE
COOP LOCAL	9	11	6	1			9			COOP LOCAL
PIA	117	152	122	87			219			PIA
MISC	41	53	52	15			76			MISC
TEST	1003	1164	563	211		3	784			TEST
FERRY	33	100	111	80			192			FERRY
PES	6	6	7	4			11			PES
TOTALS	7285	7769	7466	4363	7182	756	13423	30149	56370	TOTALS

	UNABLE TO MEET		NOT MISSION CAPABLE HOURS		TOTAL
	READINESS OCCURRENCES	REQUIREMENTS HOURS	NMCM	NMCR	
DAY	88	340	13539	5830	27133
DUTY	118	700	40614	11471	76404
TOTAL	206	1040	54163	17301	103537

CARGO SORTIES	
LOAD RANGE	VOLUME RANGE
A B C D E	A B C D E
187 108 10 1	302 19 1
AVG NO A/C ASSIGNED	22 54
AVG NO SPARE A/C ASSIGNED	57
DAYS AWAY FM HOME STATION	184
DAYS DEPLOYED ABOARD SHIP	333
TOTAL RESOURCE HOURS	12585
AVG RES HOURS PER A/C	458

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**AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1987 ABSTRACT OF OPERATIONS FISCAL YEAR**

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COAST GUARD TYPE TOTALS

MISSIONS	SORTIES	DAY	DUTY	OP-HOURS	RES HOURS	EMP-HOURS	HIGH	OTHER
CVS	6	14	5			18		
RBS	12	5	20			41		
SAR	2273	1500	2964		140	4684	71842	
DOM ICE	1			232		2		
POLAR OPS	5		5	7	5	10		
NSA	1	1				1		
ELT-FISH DOM	220	121	66			525		
ELT-FISH-FOR	93	26	21	2		242		
ELT-DRUGS	1519	743	717	14543	1209	3156	1928	
ELT-OTHER	331	79	88	4740	502	784		
MIL OPS	83	58	45	409		358	178	
OPTRA PILOTS	4921	6269	2672	200	63	8886	1588	
OPTRA CREW	1108	1086	503	2	11	1970		
OPTRA-SURFACE	303	151	90	300	48	475	101	
CADET OC	27	11	4			47		
A TO N	135	142	24	185		185		
RAD NAV	6	5	4			8		
MER	116	89	40			148		
COOP FED	99	124	42			184		
COOP STATE	24	22	5			30		
COOP LOCAL	39	31	15			52		
PIA	323	295	202	14	2	638		
MISC	111	158	37		1	210		
TEST	1834	827	465	31	18	1328		
FERRY	58	200	81			284		
PES	18	15	6			28		
TOTALS	14000	11972	8121	20480	2047	25287	73448	83471

DAY	237	1130
DUTY	299	2147
TOTAL	536	3277

AVG NO A/C ASSIGNED	41	38
AVG NO SPARE A/C ASSIGNED	92	
DAYS AWAY FM HOME STATION	268	
DAYS DEPLOYED ABOARD SHIP	829	
TOTAL RESOURCE HOURS		
AVG RES HOURS PER A/C	22140	535

NOT MISSION CAPABLE HOURS			
NMCS	NMCM	NMCB	TOTAL
17192	23868	12476	53537
47763	59617	28935	137314
44955	37485	42411	190851

CARGO SORTES									
LOAD RANGE					VOLUME RANGE				
A	B	C	D	E	A	B	C	D	E
504	750	1000	1200	1500	720	960	1200	1440	1800

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AIRCRAFT
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR

H465A

COAST GUARD TYPE TOTALS

MISSIONS		SORTIES		DAY		DUTY		OP-HOURS		RES HOURS		EMP-HOURS		HIGH		OTHER	
CVS	7	14	18	5				23								CVS	
RBS	37	41	40	3477				88								RBS	
SAR	2970	3380	1784					5538	320	151		112910				SAR	
DOM ICE	18	10	20	2				26								DOM ICE	
POLAR OPS	29	40	8	15				60	1754	37		1431				POLAR OPS	
MSA	2	2	1	2				3								MSA	
ELT-FISH-DOM	210	182	86	87				385	1902	139		100				ELT-FISH-DOM	
ELT-FISH-FOR	64	70	33	18				37	1144	129		25				ELT-FISH-FOR	
ELT-DRUGS	1685	1776	1116	737				3424	10940	1295		4544				ELT-DRUGS	
ELT-OTHER	370	443	116	89				828	4280	536		75				ELT-OTHER	
MIL OPS	157	187	118	66				277	442	80		296				MIL OPS	
OPTRA PILOTS	7277	6936	8591	4028				14359	86	105		1032				OPTRA PILOTS	
OPTRA CREW	1870	1362	1550	749				3162	12	12		902				OPTRA CREW	
OPTRA-SURFACE	468	297	267	135				744	76	59						OPTRA-SURFACE	
CADET OC	16	9	22	2				29								CADET OC	
A TO N	281	314	346	59				454		4		25				A TO N	
RAD NAV	2	4	220	100				380								RAD NAV	
MER	315	212	283	94				444	1	2						MER	
COOP FED	241	271	42	27				82								COOP FED	
COOP STATE	47	48	42	21				74								COOP STATE	
COOP LOCAL	55	51	42	21				74								COOP LOCAL	
PIA	481	581	357	305				750	4	7		25				PIA	
MISC	115	154	138	64				215	1	3		100				MISC	
TEST	2480	2881	1113	616				1808	9	18		75				TEST	
FERRY	104	278	383	126				519	5	8		93				FERRY	
PES	80	60	68	16				106								PES	
TOTALS	19381	19603	16763	10880				33911	20978	2493		121708	136304			TOTALS	

UNABLE TO MEET		READINESS REQUIREMENTS		OCCURRENCES		HOURS		NOT MISSION CAPABLE HOURS		TOTAL	
DAY	205	1492	291	NMCS	27042	NMCM	31184	NMCLB	15650	73876	DAY
DUTY	274	3076	1183	58540	65246	32525	156311			156311	DUTY
TOTAL	479	4568	30136	85582	96430	48175	230187			230187	TOTAL

AVG NO A/C ASSIGNED		AVG NO SPARE A/C		DAYS AWAY FM HOME STATION		DAYS DEPLOYED ABOARD SHIP		TOTAL RESOURCE HOURS		AVG RES HOURS PER A/C	
	58	30	291		744	57	12				
	291	1183	30136		744	57	12				
	291	1183	30136		744	57	12				

UNABLE TO MEET
READINESS REQUIREMENTS
OCCURRENCES

NOT MISSION CAPABLE HOURS

DAY
DUTY
TOTAL

CVS
RBS
SAR
DOM ICE
POLAR OPS
MSA
ELT-FISH-DOM
ELT-FISH-FOR
ELT-DRUGS
ELT-OTHER
MIL OPS
OPTRA PILOTS
OPTRA CREW
OPTRA-SURFACE
CADET OC
A TO N
RAD NAV
MER
COOP FED
COOP STATE
COOP LOCAL
PIA
MISC
TEST
FERRY
PES

AVG NO A/C ASSIGNED
AVG NO SPARE A/C ASSIGNED
DAYS AWAY FM HOME STATION
DAYS DEPLOYED ABOARD SHIP
TOTAL RESOURCE HOURS
AVG RES HOURS PER A/C

LOAD RANGE
CARGO SORTIES

VOLUME RANGE

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OPERATIONAL DATA

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CUTTERS
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1983 AIRCRAFT IN OPERATION, FISCAL YEAR 1983

COAST GUARD TYPE AVERAGE				WMEC 270 FT				WMEC 82 FT				
	MSSN	RESOURCES EMPLOYERS	RESOURCES	READINESS HIGH OTHER	MSSN	RESOURCES EMPLOYERS	RESOURCES	READINESS HIGH OTHER	MSSN	RESOURCES EMPLOYERS	RESOURCES	READINESS HIGH OTHER
CVS												
RBS												
SAR	1	2	2			1	1	16		2	2	22
DOM ICE						26	9	29		5	5	5
POLAR OPS						271	252	2758		1427	1427	1427
MSA												
ELT FISH D						1	67	37		2	2	2
ELT FISH F						5	4					
ELT DRUGS	5	593	591			205	712	250		161	161	161
ELT OTHER						111	100	5		5	5	5
MIL OPS						5	5					
MIL PREP	1	26	26			3	3					
OP TRA	3	73	73			72	46			16	16	16
CADET OC						13	2					
RESERVE						1						
BRIDGE						1	1					
A TO N						2	9					
RAD NAV												
MER						1	1					
COOP FED						19	17	2				
COOP STATE						3	2					
COOP LOCAL						1	1					
PIA						2	19			1	1	1
MISC						9	53	6				
PES PATROL												
PES SECUR												
PES OTHER												
TOTALS	10	694	692			116	1707	3108		1634	1634	1634
SCHEDULED MAINTENANCE				4852	2413							
UNSCCHEDULED MAINTENANCE				192	298							
TOTAL MAINTENANCE				5044	2711							
TOTAL HOURS ACCOUNTED FOR				5736	8760							
HOMEPORT												
U/W DAYS				0	57							
HIGH READINESS DAYS				0	88							
AVAILABLE DAYS				0	53							
MAINTENANCE DAYS				11	79							
AFHP												
U/W DAYS				40	55							
IMPORT OPERATIONAL DAYS				0	8							
MAINTENANCE DAYS				188	26							
TOTAL AFHP DAYS				228	88							
TOTAL DAYS ACCOUNTED FOR				239	365							
CUTTER EMPLOYMENT DAYS				228	190							
TOTAL CUTTERS REPORTED				1	53							

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OPERATIONAL STATISTICS

CUTTERS
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1984 ABSTRACT OF OPERATIONS FISCAL YEAR 1984

COAST GUARD TYPE TOTALS									
WMEC 270 FT					WPB 82 FT				
	MSSN	RESOURCES		READINESS	MSSN	RESOURCES		READINESS	
		EMPHRS	RESHRS			EMPHRS	RESHRS		
CUS									
RBS									
SAR	3	15	2	86	1	5	5	1504	177
DOM ICE					108	1194	409		
POLAR OPS					1480	13326	12252	130389	75958
MSA	1	20	20		9	588	522	add to ELT area	
ELT FISH D					6	72	72		
ELT FISH F					190	3601	3159	425	200
ELT DRUGS	15	1563	1515	197	2106	46391	40741	12989	10650
ELT OTHER					419	7849	5640	183	44
MIL OPS					23	721	578	40	342
MIL PREP	8	472	438	583	72	1073	860	184	
OP TRA	7	607	545	918	734	4852	2520	3	773
CADET OC					38	455	137		
RESERVE					24	206	51		
BRIDGE									
A TO N					84	743	570		
RAD NAV									
MER					6	103	100		
COOP FED					49	653	541		
COOP STATE					6	39	27		
COOP LOCAL					4	16	16		
PIA	7	219	19	33	114	860	644	28	25
MISC	16	339	315	70	781	2568	2491	703	
PES PATROL					4	46	7		
PES SECUR					21	216	161		
PES OTHER					11	60	60		
TOTALS	57	3235	2854	189	5893	85646	71563	145745	88872
SCHEDULED MAINTENANCE									
UNSCHEDULED MAINTENANCE				14214				139028	
TOTAL MAINTENANCE				376				20344	
TOTAL HOURS ACCOUNTED FOR				14590				159372	
HOMEPORT				19817				465552	
U/W DAYS				27				2812	
HIGH READINESS DAYS				7				3955	
AVAILABLE DAYS				0				2801	
MAINTENANCE DAYS				214				4469	
AFHP									
U/W DAYS				162				3237	
IMPORT OPERATIONAL DAYS				51				489	
MAINTENANCE DAYS				365				1635	
TOTAL AFHP DAYS				578				5361	
TOTAL DAYS ACCOUNTED FOR				826				19398	
CUTTER EMPLOYMENT DAYS				609				10151	
TOTAL CUTTERS REPORTED									

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OPERATIONAL STATISTICS

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CUTTERS ANNUAL EMPLOYMENT SUMMARY FISCAL YEAR 1985 ABSTRACT OF OPERATIONS FISCAL YEAR 1985

COAST GUARD TYPE TOTALS

WMEC 270 FT

WPR 82 FT

	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ	CVS
RBS	18	208	127			81	1175	475	16	1494	RBS
SAR						1479	13999	11888	5824	117312	SAR
DOM ICE						2	6	6		382	DOM ICE
POLAR OPS											POLAR OPS
MSA											MSA
ELT-FISH-DOM						91	2422	2246	26		ELT-FISH-DOM
ELT-FISH-FOR											ELT-FISH-FOR
ELT-DRUGS	20	3610	2846	57		2368	52391	46873	1337	13240	ELT-DRUGS
ELT-OTHER	4	726	683	52	8	309	7198	6372	31	389	ELT-OTHER
MIL OPS	5	932	805			58	803	597	15	46	MIL OPS
OP TRA	19	1032	789	148		758	4919	2768	2368	88	OP TRA
CADET OC						13	262	17			CADET OC
RESERVE						22	273	93	51		RESERVE
BRIDGE											BRIDGE
A TO N						72	604	525	18		A TO N
RAD NAV						1	2	2			RAD NAV
MER						11	137	94	36		MER
COOP FED						98	4317	4135	30	31	COOP FED
COOP STATE						7	105	10	2		COOP STATE
COOP LOCAL						19	99	60			COOP LOCAL
PIA	8	105	54	228		117	1118	917	109		PIA
MISC	22	471	458	185	51	267	1955	1850	392	104	MISC
PES						28	411	340	63		PES
TOTALS	96	7084	5762	670	59	5801	92196	79368	10318	133086	TOTALS

MAINTENANCE HOURS
STANDBY HOURS
TOTAL HOURS ACCOUNTED FOR

MAINTENANCE HOURS
STANDBY HOURS
TOTAL HOURS ACCOUNTED FOR

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

DAYS AVAIL FOR OPS

DAYS AVAIL FOR OPS

TTL CUTTERS REPORTED

TTL CUTTERS REPORTED

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OPERATIONAL STATISTICS

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CUTTERS ANNUAL EMPLOYMENT SUMMARY FISCAL YEAR 1986 ABSTRACT OF OPERATIONS FISCAL YEAR 1986

COAST GUARD TYPE TOTALS

COST-GUARD TYPE TOTALS										
WMEC 270 FT					WPB 82 FT					
	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ
CVS										
RBS										
SAR	33	988	941	8	6	1268	12984	10067	4056	139741
DOM ICE						1	1	1		
POLAR OPS										
MSA	1	28	9			10	107	93	41	
ELT-FISH-DOOM	24	516	516		70	98	1642	1090	47	
ELT-FISH-FOR						2	9	9		
ELT-DRUGS	38	5926	5493	146	24	1593	31988	27071	913	7709
ELT-OTHER	7	1992	1820	32	41	273	5912	5408	95	1480
MIL OPS	27	718	713	153		34	469	371	85	30
OP TRA	74	2211	1749	1196	287	839	6013	3588	2989	
CADET OC		624				13	128	48		
RESERVE	1					30	210	88	49	40
BRIDGE										
A TO N						76	535	504	15	4
RAD NAV										
MER						28	313	313	8	64
COOP FED						83	4359	4038	19	75
COOP STATE						7	24	21		
COOP LOCAL						14	146	146	9	
PIA	6	12	9	34		104	806	504	414	
MISC	9	171	171	35	17	362	2562	2531	326	64
PES						30	672	525		26
TOTALS	220	13186	11421	1604	445	4891	69196	56689	9074	150095

MAINTENANCE HOURS						178404				
STANDBY HOURS			21066			73846				
TOTAL HOURS ACCOUNTED FOR			35040			463108				

MAINTENANCE HOURS
STANDBY HOURS
TOTAL HOURS ACCOUNTED FOR

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

HOMEPORT	47					2071				
AFHP	541					2742				
TOTAL	588					4813				

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

DAYS AVAIL FOR OPS

673

TTL CUTTERS REPORTED

4

DAYS AVAIL FOR OPS

12550

TTL CUTTERS REPORTED

54

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CUTTERS ANNUAL EMPLOYMENT SUMMARY FISCAL YEAR 1987 ABSTRACT OF OPERATIONS FISCAL YEAR 1987

COAST GUARD TYPE TOTALS										
WMEC 270 FT						WPC 82 FT				
	MSSN	EMPHRS	REFSHRS	IMPORT OPS	HIGH READ	MSSN	EMPHRS	REFSHRS	IMPORT OPS	HIGH READ
CVS						1	17	2		913
RBS						15	218	28		761
SAR	62	952	RRO			1286	15795	11340	2478	115707
DOM ICE										
POLAR OPS										
MSA	4	575	105			3	20	20		MSA
ELT-FISH-DOM	5	2127	2120	153	48	279	5456	4057	425	2303
ELT-FISH-FOR						13	222	108		50
ELT-DRUGS	108	8637	7872	754	279	2310	49438	44473	1146	8053
ELT-OTHER	31	7254	2570	124	119	153	2815	2403	34	1278
MIL OPS	53	1041	927	436	131	75	1701	1550	154	20
OP TRA	67	3135	2838	1901	131	923	7337	3086	1960	
CADET OC	3	839	53	80		1	105	105	74	
RESERVE	2			16		12	137	54		
BRIDGE						42	401	365	7	
A TO N						14	67	44	24	
RAD NAV						32	772	671	2	42
MER						8	53	37	1	15
COOP FED	4	56	56			15	58	43	3	
COOP STATE						124	786	465	268	
COOP LOCAL						301	1719	1697	273	76
PIA	17	33	31	519		17	116	108	29	122
MISC	14	59	59	120						
PES										
TOTALS	370	20708	17511	4103	577	5624	87253	70562	6878	129303
MAINTENANCE HOURS						MAINTENANCE HOURS				
STANDBY HOURS						STANDBY HOURS				
TOTAL HOURS ACCOUNTED FOR						TOTAL HOURS ACCOUNTED FOR				
U/W DAYS						U/W DAYS				
IMPORT OPS DAYS						IMPORT OPS DAYS				
HIGH READINESS DAYS						HIGH READINESS DAYS				
MAINTENANCE DAYS						MAINTENANCE DAYS				
STANDBY DAYS						STANDBY DAYS				
TOTAL DAYS						TOTAL DAYS				
DAYS AVAIL FOR OPS						DAYS AVAIL FOR OPS				
TTL CUTTERS REPORTED						TTL CUTTERS REPORTED				

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CUTTERS

ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR 1988

COAST GUARD TYPE TOTALS

WMEC 230 FT											WMEC 270 FT										
	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ		MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ										
CVS	4	272	56	276																	
RBS																					
SAR	14	146	146	2			82	1082	935	1	20										
DUM ICE	1	12	12																		
POLAR OPS																					
MSA	7	1827					14	1269	39												
ELT-FISH-DOM	10	2252	1294	36			12	2226	1690	6	72										
ELT-FISH-FOR	9	2110	371																		
ELT-DRUGS	9	2172	46				114	12184	10672	803	48										
ELT-OTHER	7	1827	12				10	3642	3196	235	15										
MIL OPS							42	1625	1252	660	64										
OP TRA	6	51	11				70	3641	3347	1968	75										
CADET OC							5	1359	48	18											
RESERVE																					
BRIDGE																					
A TO N	4	12	4	12			1	2													
RAD NAV																					
MER	2	10	10	4																	
COOP FED	1	36		36			5	469	40	44											
COOP STATE																					
COOP LOCAL																					
PIA							21	392	99	416											
MISC							30	485	481	454											
PES																					
TOTALS	74	10727	1962	366			406	28376	21799	4605	294										

MAINTENANCE HOURS	6312	
STANDBY HOURS	144	
TOTAL HOURS ACCOUNTED FOR	8784	
MAINTENANCE HOURS	44723	
STANDBY HOURS	6928	
TOTAL HOURS ACCOUNTED FOR	78349	

U/W DAYS	HOMEPORT	AFHP	TOTAL	U/W DAYS	HOMEPORT	AFHP	TOTAL
IMPORT OPS DAYS	2	80	82	IMPORT OPS DAYS	71	1048	1119
HIGH READINESS DAYS	3	12	15	HIGH READINESS DAYS	86	88	174
MAINTENANCE DAYS	186	77	263	MAINTENANCE DAYS	2	3	5
STANDBY DAYS	6	6	6	STANDBY DAYS	1436	315	1751
TOTAL DAYS	191	175	366	TOTAL DAYS	115	101	216
DAYS AVAILABLE FOR OPS			103	DAYS AVAILABLE FOR OPS	1710	1555	3265
TTL CUTTERS REPORTED	1		1	TTL CUTTERS REPORTED	1514		10

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CUTTERS

ANNUAL CUTTERS EMPLOYMENT SUMMARY

FISCAL YEAR 1986 ABSTRACT OF OPERATIONS FISCAL YEAR 1986

COAST	GUARD	TYPE	TOTALS
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

	WPB						95 FT						WPB						110 FT					
	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ		MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ		MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ		MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ	
CVS		44	586																					
RBS	58	1615	1114	4	683																			
SAR	505	5342	4772	325	51649																			
DOM ICE					316																			
POLAR OPS																								
MSA	1	8																						
ELT-FISH-DOO	145	4254	3059	75	1961																			
ELT-FISH-FOR	50	929	231																					
ELT-DUGS	470	12046	10277	100	1007																			
ELT-OTHER	177	5838	5765	159	502																			
MIL OPS	32	889	836	144																				
OP TRA	315	2590	1602	2204	36																			
CADET OC	10	102	41																					
RESERVE				6																				
BRIDGE	1																							
A TO N	41	323	284	15																				
RAD NAV	1	9	6																					
MER	10	21	13	41																				
COOP FED	36	562	412	68	192																			
COOP STATE	2	16	3																					
COOP LOCAL	8	97	93	7																				
PIA	34	116	90	73																				
MISC	112	759	697	134	30																			
PES	27	299	293	257	58																			
TOTALS	2079	36401	29745	3612	56454																			
MAINTENANCE HOURS			74924																					
STANDBY HOURS			27985																					
TOTAL HOURS ACCOUNTED FOR			192720																					
U/W DAYS			HOMEPORT	AFHP	TOTAL																			
IMPORT OPS DAYS			841	1260	2101																			
HIGH READINESS DAYS			167	72	239																			
MAINTENANCE DAYS			1692	103	1795																			
STANDBY DAYS			2382	548	2930																			
TOTAL DAYS			928	37	965																			
			6010	2020	8030																			
DAYS AVAIL FOR OPS					5100																			
TTL CUTTERS REPORTED					22																			

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CUTTERS
ANNUAL EMPLOYMENT SUMMARY
FISCAL YEAR 1987 ABSTRACT OF OPERATIONS FISCAL YEAR 1987

COAST GUARD TYPE TOTALS

	WPB		95 FT		WPR		110 FT			
	MCSN	EMPHRS	REFSHRS	IMPORT OPS	HIGHT READ	MCSN	EMPHRS	REFSHRS	IMPORT OPS	HIGHT READ
CVS	33	1062	211	20	310					
RBS	57	1628	523	38	633	1	173	133	12	
SAR	340	5093	3742	255	46308	221	3033	1774	97	6162
DOM ICE										
POLAR OPS										
MSA	2	8	5			2	2	2		
ELT-FISH-DOM	112	4318	2541	67	225	49	2120	1563		682
ELT-FISH-FOR	43	964	475	2	85	2	66	33		25
ELT-DRUGS	457	18150	15919	199	1040	353	25856	23978	415	5226
ELT-OTHER	99	4929	3500	42	353	13	1063	257	14	194
MIL OPS	31	416	355	139		24	924	740	309	35
OP TRA	281	2436	1473	720		244	5155	1097	1596	239
CADET OC	2	8	8	40		40	1796	153	114	
RESERVE	32	83	25			1	53	10		
BRIDGE										
A TO N	57	391	369	32		15	40	38	12	
RAD NAV						2	28	3	1	19
MER	18	73	63	29		2			3	
COOP FED	45	849	662	4	11	15	725	399	6	48
COOP STATE	15	164	137	78	86	2	14	12		
COOP LOCAL	12	181	168	28		3	18	9	3	
PIA	55	295	277	349		95	704	229	465	16
MISC	74	1237	1033	257	5	44	1116	965	347	63
PES	10	183	177	10		7	85	63	133	
TOTALS	1809	42468	31716	2309	49176	1150	42912	31026	3527	12709

MAINTENANCE HOURS	60410									
STANDBY HOURS	24968									
TOTAL HOURS ACCOUNTED FOR	168579									

MAINTENANCE HOURS
STANDBY HOURS
TOTAL HOURS ACCOUNTED FOR

U/W DAYS	HOMEPORT	AFHP	TOTAL	HOMEPORT	AFHP	TOTAL
IMPORT OPS DAYS	729	1342	2071	298	1535	1833
HIGH READINESS DAYS	108	21	129	108	72	180
MAINTENANCE DAYS	1533	62	1595	296	52	348
STANDBY DAYS	1927	467	2394	2128	110	2238
TOTAL DAYS	803	35	838	315	64	379
	5100	1927	7027	3145	1833	4978

DAYS AVAIL FOR OPS
TTL CUTTERS REPORTED

DAYS AVAIL FOR OPS
TTL CUTTERS REPORTED

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OPERATIONAL STATISTICS

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CUTTERS ANNUAL EMPLOYMENT SUMMARY FISCAL YEAR 1988 ABSTRACT OF OPERATIONS FISCAL YEAR 1988

COAST GUARD TYPE TOTALS

	WPB 95 FT				WPB 110 FT			
	MSSN	EMPHRS	RESHRS	IMPORT OPS	HIGH READ	MSSN	EMPHRS	RESHRS
CVS	19	566	117			127	94	90
RBS	35	840	348	3		71	428	93
SAR	303	3734	3605	81	39781	240	3557	1727
DOM ICE								
POLAR OPS								
MSA	1	8	8			51	2035	1677
ELT-FISH-DOM	98	3378	2925	30	1994	1		
ELT-FISH-FOR	8	162	73			317	26021	23609
ELT-DRUGS	340	13504	12301	259	3029	42	3076	1279
ELT-OTHER	73	2449	1736	87	376	45	1529	1384
MIL OPS	34	734	684	84	40	692	4864	2053
CP TRA	316	1492	983	1247		75	1745	239
CADET OC	1	20	16			9	93	51
RESERVE	30	50	40	134		30	137	135
BRIDGE	36	200	175	54		11	7	4
A TO N	1	6	6	4		27	441	291
RAD NAV	2			46	98	4	19	19
MER	34	604	575	4		6	13	10
COOP FED	7	46	46	51		57	244	155
COOP STATE	6	21	21	197		110	1021	803
COOP LOCAL	38	204	189	122		9	188	170
PIA	72	929	905	9	119	1927	45517	33797
MISC	14	281	277					
PES								
TOTALS	1468	29228	25030	2408	45437	1927	45517	33797

MAINTENANCE HOURS	49647					80626		
STANDBY HOURS	23446					19708		
TOTAL HOURS ACCOUNTED FOR	145968					160985		

MAINTENANCE HOURS
STANDBY HOURS
TOTAL HOURS ACCOUNTED FOR

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

HOMEPORT	636					433		
AFHP	1105					1671		
TOTAL	1741					2104		

U/W DAYS
IMPORT OPS DAYS
HIGH READINESS DAYS
MAINTENANCE DAYS
STANDBY DAYS
TOTAL DAYS

DAYS AVAILABLE FOR OPS

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TTL CUTTERS REPORTED

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TTL CUTTERS REPORTED

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APPENDIX C. MINITAB REGRESSION OUTPUT

A. ANALYSIS OF TOTAL OE COSTS FOR THE HU-25A.

	TotlOEAd	AFlt-Hrs	ASorties
AFlt-Hrs	-0.116		
ASorties	0.103	0.949	
AAvg-A/C	0.189	0.951	0.953

B. ANALYSIS OF OG-30 COSTS FOR THE HU-25A.

	OG30TAdj	AFlt-Hrs	ASorties
AFlt-Hrs	0.978		
ASorties	0.960	0.949	
AAvg-A/C	0.995	0.951	0.953

The regression equation is
OG30TAdj = -27350672 + 1687 AFlt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	-27350672	5339559	-5.12
AFlt-Hrs	1686.8	255.3	6.61

s = 380157 R-sq = 95.6% R-sq(adj) = 93.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.307466E+12	6.307466E+12
Error	2	289038204928	144519069696
Total	3	6.596504E+12	

The regression equation is
 $OG30TAdj = -42294832 + 5725 ASorties$

Predictor	Coef	Stdev	t-ratio
Constant	-42294832	10347028	-4.09
ASorties	5725	1180	4.85

$s = 508116$ $R-sq = 92.2\%$ $R-sq(adj) = 88.3\%$

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.080140E+12	6.080140E+12
Error	2	516364500992	258182217728
Total	3	6.596504E+12	

Unusual Observations

Obs.	ASorties	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	8397	5833935	78248	506074	55687	1.22 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 $OG30TAdj = -21196960 + 901253 AAvG-A/C$

Predictor	Coef	Stdev	t-ratio
Constant	-21196960	2115245	-10.02
AAvg-A/C	901253	65450	13.77

$s = 185541$ $R-sq = 99.0\%$ $R-sq(adj) = 98.4\%$

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.527653E+12	6.527653E+12
Error	2	68851007488	34425503744
Total	3	6.596504E+12	

The regression equation is

$$\text{JG30TAdj} = -33152464 + 1161 \text{ AFlt-Hrs} + 1916 \text{ ASorties}$$

Predictor	Coef	Stdev	t-ratio
Constant	-33152464	12449226	-2.66
AFlt-Hrs	1161	1007	1.15
ASorties	1916	3483	0.55

s = 471042 R-sq = 96.6% R-sq(adj) = 89.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.374624E+12	3.187311E+12
Error	1	221880123392	221880123392
Total	3	6.596504E+12	

SOURCE	DF	SEQ SS
AFlt-Hrs	1	6.307466E+12
ASorties	1	67158069248

Unusual Observations

Obs.	AFlt-Hrs	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	19723	5833935	5825988	470974	7947	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG30TAdj} = -21167936 - 6722 \text{ AFlt-Hrs} + 900415 \text{ AAvg-A/C}$$

Predictor	Coef	Stdev	t-ratio
Constant	-21167936	3039210	-6.96
AFlt-Hrs	-6722	129460	-0.05
AAvg-A/C	900415	93834	9.60

s = 262042 R-sq = 99.0% R-sq(adj) = 96.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.527839E+12	3.263919E+12
Error	1	68665921536	68665921536
Total	3	6.596504E+12	

SOURCE	DF	SEQ SS
AFlt-Hrs	1	205157761024
AAvg-A/C	1	6.322680E+12

Unusual Observations

Obs.	AFlt-Hrs	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	1.22	5833935	5845273	261796	-11338	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG30TAdj} = -21167936 + 900415 \text{ AAvg-A/C} - 6722 \text{ AFlt-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-21167936	3039210	-6.96
AAvg-A/C	900415	93834	9.60
AFlt-Hrs	-6722	129460	-0.05

s = 262042 P-sq = 99.0% R-sq(adj) = 96.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.527839E+12	3.263919E+12
Error	1	68665921536	68665921536
Total	3	6.596504E+12	

SOURCE	DF	SEQ SS
AAvg-A/C	1	6.527653E+12
AFlt-Hrs	1	185108192

Unusual Observations

Obs.	AAvg-A/C	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	30.0	5833935	5845273	261796	-11338	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG30TAdj} = -24396432 + 782 \text{ ASorties} + 788067 \text{ AAvg-A/C}$$

Predictor	Coef	Stdev	t-ratio
Constant	-24396432	8070304	-3.02
ASorties	782	1853	0.42
AAvg-A/C	788067	281558	2.80

s = 241766 R-sq = 99.1% R-sq(adj) = 97.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.538054E+12	3.269027E+12
Error	1	58451021824	58451021824
Total	3	6.596505E+12	

SOURCE	DF	SEQ SS
ASorties	1	6.080140E+12
AAvg-A/C	1	457913466890

Unusual Observations

Obs.	ASorties	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	8397	5833935	5817402	241200	16533	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG30TAdj} = -24396432 + 788067 \text{ AAvg-A/C} + 782 \text{ ASorties}$$

Predictor	Coef	Stdev	t-ratio
Constant	-24396432	8070305	-3.02
AAvg-A/C	788067	281558	2.80
ASorties	782	1853	0.42

s = 241766 R-sq = 99.1% R-sq(adj) = 97.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.538054E+12	3.269027E+12
Error	1	58451021824	58451021824
Total	3	6.596505E+12	

SOURCE	DF	SEQ SS
AAvg-A/C	1	6.527653E+12
ASorties	1	10400006144

Unusual Observations

Obs.	AAvg-A/C	OG30TAdj	Fit	Stdev.Fit	Residual	St.Resid
4	30.0	5833935	5817402	241200	16533	1.00 X

X denotes an obs. whose X value gives it large influence.

C. ANALYSIS OF OG-41 COSTS FOR THE HU-25A.

	OG41	Flt-Hrs	Sorties
Flt-Hrs	0.328		
Sorties	0.407	0.949	
Avg-A/C	-0.372	0.951	0.953

The regression equation is

$$\text{OG41} = -40798912 + 2959 \text{ Flt-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-40798912	100968656	-0.40
Flt-Hrs	2959	4925	0.60

s = 1192.12 R-sq = 10.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	5.128911E+13	5.128911E+13
Error	3	4.262849E+14	1.420950E+14
Total	4	4.775738E+14	

The regression equation is
 OG41 = -93684464 + 13116 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	-93684464	147041776	-0.64
Sorties	13116	16987	0.77

s = 11523961 R-sq = 16.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	7.916920E+13	7.916920E+13
Error	3	3.984049E+14	1.328016E+14
Total	4	4.775741E+14	

The regression equation is
 OG41 = 1.08E+08 - 2723428 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	108272544	127771520	0.85
Avg-A/C	-2723428	3928851	-0.69

s = 11713836 R-sq = 13.8% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.593236E+13	6.593236E+13
Error	3	4.116417E+14	1.372139E+14
Total	4	4.775741E+14	

The regression equation is
 OG41 = -2.52E+08 - 16187 Flt-Hrs + 69707 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	-251860224	310864128	-0.81
Flt-Hrs	-16187	26914	-0.60
Sorties	69707	96025	0.73

s = 12988227 R-sq = 29.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.401862E+14	7.009308E+13
Error	2	3.373879E+14	1.686940E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Flt-Hrs	1	5.128911E+13
Sorties	1	8.889703E+13

The regression equation is

$$OG41 = -2.52E+08 + 69707 \text{ Sorties} - 16187 \text{ Flt-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-251860224	310864128	-0.81
Sorties	69707	96025	0.73
Flt-Hrs	-16187	26914	-0.60

s = 12988227 R-sq = 29.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.401862E+14	7.009308E+13
Error	2	3.373879E+14	1.686940E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Sorties	1	7.916920E+13
Flt-Hrs	1	6.101696E+13

The regression equation is

$$OG41 = 53956304 + 4440 \text{ Flt-Hrs} - 3849050 \text{ Avg-A/C}$$

Predictor	Coef	Stdev	t-ratio
Constant	53956304	150469328	0.36
Flt-Hrs	4440	5392	0.82
Avg-A/C	-3849050	4377374	-0.88

s = 12398272 R-sq = 35.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.701399E+14	8.506996E+13
Error	2	3.074343E+14	1.537171E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Flt-Hrs	1	5.128911E+13
Avg-A/C	1	1.188508E+14

The regression equation is
 OG41 = 53956304 - 3849050 Avg-A/C + 4440 Flt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	53956304	150469328	0.36
Avg-A/C	-3849050	4377373	-0.88
Flt-Hrs	4440	5392	0.82

s = 12398272 R-sq = 35.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.701399E+14	8.506996E+13
Error	2	3.074343E+14	1.537171E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Avg-A/C	1	6.593236E+13
Flt-Hrs	1	1.042076E+14

The regression equation is
 OG41 = -10855380 + 19318 Sorties - 4200317 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	-10855380	165829216	-0.07
Sorties	19318	17820	1.08
Avg-A/C	-4200317	4054590	-1.04

s = 11385939 R-sq = 45.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.182950E+14	1.091475E+14
Error	2	2.592792E+14	1.296396E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Sorties	1	7.916920E+13
Avg-A/C	1	1.391258E+14

The regression equation is

$$OG41 = -10855380 - 4200317 \text{ Avg-A/C} + 19318 \text{ Sorties}$$

Predictor	Coef	Stdev	t-ratio
Constant	-10855380	165829216	-0.07
Avg-A/C	-4200317	4054589	-1.04
Sorties	19318	17820	1.08

s = 11385939 R-sq = 45.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.182950E+14	1.091475E+14
Error	2	2.592792E+14	1.296396E+14
Total	4	4.775741E+14	

SOURCE	DF	SEQ SS
Avg-A/C	1	6.593236E+13
Sorties	1	1.523627E+14

D. ANALYSIS OF OG-42 COSTS FOR THE HU-25A.

	OG42Adj	AFlt-Hrs	ASorties
AFlt-Hrs	0.866		
ASorties	0.914	0.949	
AAvg-A/C	0.977	0.951	0.953

The regression equation is

$$OG42Adj = 3431087 - 369952 \text{ AFlt-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	3431087	1495103	2.29
AFlt-Hrs	-369952	1400240	-0.26

s = 2877143 R-sq = 3.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	577841004544	577841004544
Error	2	1.655591E+13	8.277954E+12
Total	3	1.713375E+13	

The regression equation is
 OG42Adj = -73718336 + 8787 ASorties

Predictor	Coef	Stdev	t-ratio
Constant	-73718336	24143984	-3.05
ASorties	8787	2753	3.19

s = 1185650 R-sq = 83.6% R-sq(adj) = 75.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.432221E+13	1.432221E+13
Error	2	2.811534E+12	1.405767E+12
Total	3	1.713375E+13	

Unusual Observations

Obs.	ASorties	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	8397	89942	63623	1180883	26319	0.25 X

X denotes an obs. whose X value gives it large influence.

OG42Adj = -42756912 + 1427190 AAvg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	-42756912	7048636	-6.07
AAvg-A/C	1427190	218098	6.54

s = 618279 R-sq = 95.5% R-sq(adj) = 93.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.636921E+13	1.636921E+13
Error	2	764537864192	382268932096
Total	3	1.713375E+13	

The regression equation is
 $OG42Adj = -84280544 + 559293 \text{ AFlt-Hrs} + 9973 \text{ ASorties}$

Predictor	Coef	Stdev	t-ratio
Constant	-84280544	30180336	-2.79
AFlt-Hrs	559293	719102	0.78
ASorties	9973	3431	2.91

s = 1323564 R-sq = 89.8% R-sq(adj) = 69.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.538193E+13	7.690963E+12
Error	1	1.751822E+12	1.751822E+12
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
AFlt-Hrs	1	577841004544
ASorties	1	1.480409E+13

Unusual Observations

Obs.	AFlt-Hrs	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	1.22	89942	145206	1322409	-55264	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 $OG42Adj = -84280544 + 9973 \text{ ASorties} + 559293 \text{ AFlt-Hrs}$

Predictor	Coef	Stdev	t-ratio
Constant	-84280544	30180336	-2.79
ASorties	9973	3431	2.91
AFlt-Hrs	559293	719102	0.78

s = 1323564 R-sq = 89.8% R-sq(adj) = 69.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.538193E+13	7.690963E+12
Error	1	1.751822E+12	1.751822E+12
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
ASorties	1	1.432221E+13
AFlt-Hrs	1	1.059712E+12

Unusual Observations

Obs.	ASorties	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	8397	89942	145206	1322409	-55264	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG42Adj} = -42618096 - 32156 \text{ AFlt-Hrs} + 1423181 \text{ AAvg-A/C}$$

Predictor	Coef	Stdev	t-ratio
Constant	-42618096	10113071	-4.21
AFlt-Hrs	-32156	430782	-0.07
AAvg-A/C	1423181	312237	4.56

s = 871953 R-sq = 95.6% R-sq(adj) = 86.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.637345E+13	8.186724E+12
Error	1	760301420544	760301420544
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
AFlt-Hrs	1	577841004544
AAvg-A/C	1	1.579561E+13

Unusual Observations

Obs.	AFlt-Hrs	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	1.22	89942	52211	871136	37731	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG42Adj} = -42618096 + 1423181 \text{ AAvg-A/C} - 32156 \text{ AFlt-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-42618096	10113071	-4.21
AAvg-A/C	1423181	312237	4.56
AFlt-Hrs	-32156	430782	-0.07

s = 871953 R-sq = 95.6% R-sq(adj) = 86.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.637345E+13	8.186724E+12
Error	1	760301420544	760301420544
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
AAvg-A/C	1	1.636921E+13
AFlt-Hrs	1	4236489984

Unusual Observations

Obs.	AAvg-A/C	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	30.	89942	52211	871136	37731	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG42Adj} = -35366224 - 1806 \text{ASorties} + 1688646 \text{AAvg-A/C}$$

Predictor	Coef	Stdev	t-ratio
Constant	-35366224	28108032	-1.26
ASorties	-1806	6454	-0.28
AAvg-A/C	1688646	980637	1.72

s = 842048 R-sq = 95.9% R-sq(adj) = 87.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.642471E+13	8.212353E+12
Error	1	709044076544	709044076544
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
ASorties	1	1.432221E+13
AAvg-A/C	1	2.102490E+12

Unusual Observations

Obs.	ASorties	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	8397	89942	147522	840076	-57580	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is

$$\text{OG42Adj} = -35366224 + 1688646 \text{AAvg-A/C} - 1806 \text{ASorties}$$

Predictor	Coef	Stdev	t-ratio
Constant	-35366224	28108032	-1.26
AAvg-A/C	1688646	980637	1.72
ASorties	-1806	6454	-0.28

s = 842048 R-sq = 95.9% R-sq(adj) = 87.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.642471E+13	8.212353E+12
Error	1	709044076544	709044076544
Total	3	1.713375E+13	

SOURCE	DF	SEQ SS
AAvg-A/C	1	1.636921E+13
ASorties	1	55493779456

Unusual Observations

Obs.	AAvg-A/C	OG42Adj	Fit	Stdev.Fit	Residual	St.Resid
4	30.0	89942	147522	840076	-57580	-1.00 X

X denotes an obs. whose X value gives it large influence.

E. ANALYSIS OF TOTAL OE COSTS FOR THE HH-65A.

	TotalOE	Flt-Hrs	Sorties
Flt-Hrs	0.971		
Sorties	0.972	1.000	
Avg-A/C	0.972	1.000	1.000

The regression equation is
 TotalOE = 3889410 + 987 Flt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	3889410	5052182	0.77
Flt-Hrs	987.3	242.0	4.08

s = 2706730 R-sq = 94.3% R-sq(adj) = 88.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.219633E+14	1.219633E+14
Error	1	7.326392E+12	7.326392E+12
Total	2	1.292897E+14	

The regression equation is
 TotalOE = 5279717 + 1321 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	5279717	4636549	1.14
Sorties	1320.6	317.3	4.16

s = 2656260 R-sq = 94.5% R-sq(adj) = 89.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.222339E+14	1.222339E+14
Error	1	7.055719E+12	7.055719E+12
Total	2	1.292897E+14	

The regression equation is
 TotalOE = 5685976 + 437061 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	5685976	4537399	1.25
Avg-A/C	437061	104840	4.17

s = 2652282 R-sq = 94.6% R-sq(adj) = 89.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.222551E+14	1.222551E+14
Error	1	7.034601E+12	7.034601E+12
Total	2	1.292897E+14	

F. ANALYSIS OF OG-30 COSTS FOR THE HH-65A.

	OG30TOTL	Flt-Hrs	Sorties
Flt-Hrs	0.940		
Sorties	0.942	1.000	
Avg-A/C	0.942	1.000	1.000

The regression equation is
 OG30TOTL = 1467987 + 288 Flt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	1467987	2177245	0.67
Flt-Hrs	287.6	104.3	2.76

s = 1166469 R-sq = 88.4% R-sq(adj) = 76.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.034942E+13	1.034942E+13
Error	1	1.360651E+12	1.360651E+12
Total	2	1.171007E+13	

The regression equation is
 OG30TOTL = 1870142 + 385 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	1870142	2010423	0.93
Sorties	384.9	137.6	2.80

s = 1151763 R-sq = 88.7% R-sq(adj) = 77.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.038351E+13	1.038351E+13
Error	1	1.326559E+12	1.326559E+12
Total	2	1.171007E+13	

The regression equation is
 OG30TOTL = 1988331 + 127390 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	1988331	1968398	1.01
Avg-A/C	127390	45482	2.80

s = 1150604 R-sq = 88.7% R-sq(adj) = 77.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.038618E+13	1.038618E+13
Error	1	1.323889E+12	1.323889E+12
Total	2	1.171007E+13	

G. ANALYSIS OF OG-41 COSTS FOR THE HH-65A.

	OG41	Flt-Hrs	Sorties
Flt-Hrs	0.987		
Sorties	0.987	1.000	
Avg-A/C	0.988	1.000	1.000

The regression equation is
 OG41 = - 377652 + 722 Flt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	-377652	2478716	-0.15
Flt-Hrs	722.0	118.7	6.08

s = 1327984 R-sq = 97.4% R-sq(adj) = 94.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.523436E+13	6.523436E+13
Error	1	1.763541E+12	1.763541E+12
Total	2	6.699790E+13	

The regression equation is
 OG41 = 644048 + 965 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	644048	2253602	0.29
Sorties	965.5	154.2	6.26

s = 1291079 R-sq = 97.5% R-sq(adj) = 95.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.533102E+13	6.533102E+13
Error	1	1.666886E+12	1.666886E+12
Total	2	6.699790E+13	

The regression equation is
 OG41 = 941432 + 319517 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	941432	2203742	0.43
Avg-A/C	319517	50919	6.27

s = 1288171 R-sq = 97.5% R-sq(adj) = 95.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.533852E+13	6.533852E+13
Error	1	1.659385E+12	1.659385E+12
Total	2	6.699790E+13	

H. ANALYSIS OF OG-42 COSTS FOR THE HH-65A.

	OG42	Flt-Hrs	Sorties
Flt-Hrs	-0.762		
Sorties	-0.759	1.000	
Avg-A/C	-0.759	1.000	1.000

The regression equation is
 OG42 = 2799063 - 22.4 Flt-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	2799063	396219	7.06
Flt-Hrs	-22.36	18.98	-1.18

s = 212276 R-sq = 58.1% R-sq(adj) = 16.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	62560428032	62560428032
Error	1	45061246976	45061246976
Total	2	107621646336	

The regression equation is
 OG42 = 2765516 - 29.8 Sorties

Predictor	Coef	Stdev	t-ratio
Constant	2765516	372522	7.42
Sorties	-29.76	25.49	-1.17

s = 213417 R-sq = 57.7% R-sq(adj) = 15.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	62075043840	62075043840
Error	1	45546631168	45546631168
Total	2	107621646336	

The regression equation is
 OG42 = 2756203 - 9845 Avg-A/C

Predictor	Coef	Stdev	t-ratio
Constant	2756203	365256	7.55
Avg-A/C	-9845	8440	-1.17

s = 213506 R-sq = 57.6% R-sq(adj) = 15.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	62036779008	62036779008
Error	1	45584896000	45584896000
Total	2	107621646336	

I. ANALYSIS OF TOTAL OE COSTS FOR THE 270 WMEC.

	TOTLOE	DAFHP	DAYS U/W	MSNS	RES HRS	DAYS AFO	AVG NO	FY
DAFHP	0.837							
Days-U/W	0.976	0.922						
Missions	0.985	0.883	0.990					
Res-Hrs	0.981	0.907	0.999	0.995				
DaysAFO	0.951	0.956	0.994	0.975	0.990			
Avg-No	0.937	0.959	0.973	0.940	0.963	0.983		
FY	0.979	0.923	0.991	0.976	0.987	0.985	0.988	
Inv-Cost	0.874	0.819	0.849	0.820	0.840	0.850	0.922	0.906

The regression equation is

TotalOE = - 663602 + 6411 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-663602	1946324	-0.34
DAFHP	6411	2097	3.06

s = 2176314 R-sq = 70.0% R-sq(adj) = 62.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	4.427675E+13	4.427675E+13
Error	4	1.894537E+13	4.736342E+12
Total	5	6.322212E+13	

The regression equation is
TotalOE = 258085 + 8367 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	258085	606298	0.43
Days-U/W	8366.7	939.5	8.91

s = 871137 R-sq = 95.2% R-sq(adj) = 94.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.018662E+13	6.018662E+13
Error	4	3.035517E+12	758879354880
Total	5	6.322212E+13	

The regression equation is
TotalOE = 569437 + 21027 Missions

Predictor	Coef	Stdev	t-ratio
Constant	569437	448416	1.27
Missions	21027	1824	11.53

s = 679531 R-sq = 97.1% R-sq(adj) = 96.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.137508E+13	6.137508E+13
Error	4	1.847050E+12	461762461696
Total	5	6.322212E+13	

The regression equation is
TotalOE = 480483 + 415 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	480483	523340	0.92
Res-Hrs	414.79	41.50	9.99

s = 780090 R-sq = 96.1% R-sq(adj) = 95.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.078796E+13	6.078796E+13
Error	4	2.434164E+12	608541081600
Total	5	6.322212E+13	

The regression equation is
 TotalOE = 440124 + 6168 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	440124	846926	0.52
DaysAFO	6168	1004	6.15

s = 1230271 R-sq = 90.4% R-sq(adj) = 88.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	5.716786E+13	5.716786E+13
Error	4	6.054269E+12	1.513567E+12
Total	5	6.322212E+13	

The regression equation is
 TotalOE = - 769692 + 1101822 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	-769692	1151875	-0.67
Avg-No	1101822	204739	5.38

s = 1384941 R-sq = 87.9% R-sq(adj) = 84.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	5.554988E+13	5.554988E+13
Error	4	7.672246E+12	1.918062E+12
Total	5	6.322212E+13	

The regression equation is
 TotalOE = -1.54E+08 + 1860123 FY

Predictor	Coef	Stdev	t-ratio
Constant	-154409456	16705156	-9.24
FY	1860123	195343	9.52

s = 817178 R-sq = 95.8% R-sq(adj) = 94.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	6.055100E+13	6.055100E+13
Error	4	2.671123E+12	667780644864
Total	5	6.322212E+13	

The regression equation is
 $\text{TotalOE} = -61073808 + 0.0894 \text{ Inv-Cost}$

Predictor	Coef	Stdev	t-ratio
Constant	-61073808	18268960	-3.34
Inv-Cost	0.08941	0.02484	3.60

s = 1930779 R-sq = 76.4% R-sq(adj) = 70.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	4.831050E+13	4.831050E+13
Error	4	1.491164E+13	3.727909E+12
Total	5	6.322212E+13	

The regression equation is
 $\text{TotalOE} = -13968583 + 17483 \text{ Missions} + 0.0207 \text{ Inv-Cost}$

Predictor	Coef	Stdev	t-ratio
Constant	-13968583	9095319	-1.54
Missions	17483	2702	6.47
Inv-Cost	0.02071	0.01295	1.60

s = 576403 R-sq = 98.4% R-sq(adj) = 97.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.222542E+13	3.111271E+13
Error	3	996721229824	332240388096
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
Missions	1	6.137508E+13
Inv-Cost	1	850328813568

The regression equation is

$$\text{TotalOE} = -13968583 + 0.0207 \text{ Inv-Cost} + 17483 \text{ Missions}$$

Predictor	Coef	Stdev	t-ratio
Constant	-13968583	9095320	-1.54
Inv-Cost	0.02071	0.01295	1.60
Missions	17483	2702	6.47

s = 576403 R-sq = 98.4% R-sq(adj) = 97.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.222542E+13	3.111271E+13
Error	3	996721229824	332240388096
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
Missions	1	1.391491E+13

The regression equation is

$$\text{TotalOE} = -11814049 + 354 \text{ Res-Hrs} + 0.0176 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-11814049	13165031	-0.90
Res-Hrs	353.79	77.71	4.55
Inv-Cost	0.01756	0.01879	0.93

s = 792721 R-sq = 97.0% R-sq(adj) = 95.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.133691E+13	3.066845E+13
Error	3	1.885219E+12	628406353920
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Res-Hrs	1	6.078796E+13
Inv-Cost	1	548945657856

The regression equation is

$$\text{TotalOE} = -11474528 + 7170 \text{ Days-U/W} + 0.0168 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-11474528	15688237	-0.73
Days-U/W	7170	1884	3.81
Inv-Cost	0.01682	0.02247	0.75

s = 923373 R-sq = 96.0% R-sq(adj) = 93.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.066428E+13	3.033213E+13
Error	3	2.557851E+12	852617068544
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Days-U/W	1	6.018662E+13
Inv-Cost	1	477665820672

The regression equation is

$$\text{TotalOE} = -11474528 + 0.0168 \text{ Inv-Cost} + 7170 \text{ Days-U/W}$$

Predictor	Coef	Stdev	t-ratio
Constant	-11474528	15688237	-0.73
Inv-Cost	0.01682	0.02247	0.75
Days-U/W	7170	1884	3.81

s = 923373 R-sq = 96.0% R-sq(adj) = 93.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.066428E+13	3.033213E+13
Error	3	2.557851E+12	852617068544
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
Days-U/W	1	1.235378E+13

The regression equation is

$$\text{TotalOE} = -1.60\text{E}+08 + 1984989 \text{ FY} - 0.0074 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-159637904	27669584	-5.77
FY	1984989	528112	3.76
Inv-Cost	-0.00741	0.02842	-0.26

s = 933075 R-sq = 95.9% R-sq(adj) = 93.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.061024E+13	3.030512E+13
Error	3	2.611885E+12	870628458496
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
FY	1	6.055100E+13
Inv-Cost	1	59237355520

The regression equation is

$$\text{TotalOE} = -1.60\text{E}+08 - 0.0074 \text{ Inv-Cost} + 1984989 \text{ FY}$$

Predictor	Coef	Stdev	t-ratio
Constant	-159637904	27669584	-5.77
Inv-Cost	-0.00741	0.02842	-0.26
FY	1984989	528112	3.76

s = 933075 R-sq = 95.9% R-sq(adj) = 93.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.061024E+13	3.030512E+13
Error	3	2.611885E+12	870628458496
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
FY	1	1.229975E+13

The regression equation is

$$\text{TotalOE} = -16472210 + 4862 \text{ DaysAFO} + 0.0242 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-16472210	22207808	-0.74
DaysAFO	4862	2015	2.41
Inv-Cost	0.02422	0.03178	0.76

s = 1300273 R-sq = 92.0% R-sq(adj) = 86.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.815000E+13	2.907500E+13
Error	3	5.072135E+12	1.690711E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DaysAFO	1	5.716786E+13
Inv-Cost	1	982133768192

The regression equation is

$$\text{TotalOE} = -16472210 + 0.0242 \text{ Inv-Cost} + 4862 \text{ DaysAFO}$$

Predictor	Coef	Stdev	t-ratio
Constant	-16472210	22207808	-0.74
Inv-Cost	0.02422	0.03178	0.76
DaysAFO	4862	2015	2.41

s = 1300273 R-sq = 92.0% R-sq(adj) = 86.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.815000E+13	2.907500E+13
Error	3	5.072135E+12	1.690711E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
DaysAFO	1	9.839500E+12

The regression equation is

$$\text{TotalOE} = -5245363 + 1032352 \text{ Avg-No} + 0.0066 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5245363	36297008	-0.14
Avg-No	1032352	610407	1.69
Inv-Cost	0.00655	0.05311	0.12

s = 1595149 R-sq = 87.9% R-sq(adj) = 79.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.558862E+13	2.779431E+13
Error	3	7.633506E+12	2.544502E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Avg-No	1	5.554988E+13
Inv-Cost	1	38739804160

The regression equation is

$$\text{TotalOE} = -5245363 + 0.0066 \text{ Inv-Cost} + 1032352 \text{ Avg-No}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5245363	36297008	-0.14
Inv-Cost	0.00655	0.05311	0.12
Avg-No	1032352	610407	1.69

s = 1595149 R-sq = 87.9% R-sq(adj) = 79.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.558862E+13	2.779431E+13
Error	3	7.633506E+12	2.544502E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
Avg-No	1	7.278129E+12

The regression equation is
 TotalOE = -40782480 + 2815 DAFHP + 0.0586 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-40782480	30838640	-1.32
DAFHP	2815	3370	0.84
Inv-Cost	0.05863	0.04499	1.30

s = 2008108 R-sq = 80.9% R-sq(adj) = 68.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.112464E+13	2.556232E+13
Error	3	1.209750E+13	4.032499E+12
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
Inv-Cost	1	6.847884E+12

The regression equation is
 TotalOE = -40782480 + 0.0586 Inv-Cost + 2815 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-40782480	30838640	-1.32
Inv-Cost	0.05863	0.04499	1.30
DAFHP	2815	3370	0.84

s = 2008108 R-sq = 80.9% R-sq(adj) = 68.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.112464E+13	2.556232E+13
Error	3	1.209750E+13	4.032499E+12
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	4.831050E+13
DAFHP	1	2.814137E+12

The regression equation is

$$\text{TotalOE} = 1174254 + 11666 \text{ Days-U/W} - 3198 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	1174254	676136	1.74
Days-U/W	11666	1890	6.17
DAFHP	-3198	1688	-1.89

s = 678812 R-sq = 97.8% R-sq(adj) = 96.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.183978E+13	3.091989E+13
Error	3	1.382357E+12	460785516544
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Days-U/W	1	6.018662E+13
DAFHP	1	1.653160E+12

The regression equation is

$$\text{TotalOE} = 1174254 - 3198 \text{ DAFHP} + 11666 \text{ Days-U/W}$$

Predictor	Coef	Stdev	t-ratio
Constant	1174254	676136	1.74
DAFHP	-3198	1688	-1.89
Days-U/W	11666	1890	6.17

s = 678812 R-sq = 97.8% R-sq(adj) = 96.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.183978E+13	3.091989E+13
Error	3	1.382357E+12	460785516544
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
Days-U/W	1	1.756303E+13

The regression equation is
 TotalOE = 969867 + 23833 Missions - 1141 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	969867	698847	1.39
Missions	23833	4089	5.83
DAFHP	-1141	1468	-0.78

s = 715841 R-sq = 97.6% R-sq(adj) = 95.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.168486E+13	3.084243E+13
Error	3	1.537284E+12	512427884544
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
Missions	1	6.137508E+13
DAFHP	1	309766062080

The regression equation is
 TotalOE = 969867 - 1141 DAFHP + 23833 Missions

Predictor	Coef	Stdev	t-ratio
Constant	969867	698847	1.39
DAFHP	-1141	1468	-0.78
Missions	23833	4089	5.83

s = 715841 R-sq = 97.6% R-sq(adj) = 95.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.168486E+13	3.084243E+13
Error	3	1.537284E+12	512427884544
Total	5	6.322214E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
Missions	1	1.740810E+13

The regression equation is
 TotalOE = 1224069 + 530 Res-Hrs - 2291 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	1224069	692694	1.77
Res-Hrs	529.59	87.52	6.05
DAFHP	-2291	1585	-1.45

s = 691552 R-sq = 97.7% R-sq(adj) = 96.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.178740E+13	3.089370E+13
Error	3	1.434733E+12	478244306944
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Res-Hrs	1	6.078796E+13
DAFHP	1	999431340032

The regression equation is
 TotalOE = 1224069 - 2291 DAFHP + 530 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	1224069	692694	1.77
DAFHP	-2291	1585	-1.45
Res-Hrs	529.59	87.52	6.05

s = 691552 R-sq = 97.7% R-sq(adj) = 96.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.178740E+13	3.089370E+13
Error	3	1.434733E+12	478244306944
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
Res-Hrs	1	1.751065E+13

The regression equation is

$$\text{TotalOE} = 2222563 + 11400 \text{ DaysAFO} - 6463 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	2222563	974155	2.28
DaysAFO	11400	2382	4.78
DAFHP	-6463	2814	-2.30

s = 855344 R-sq = 96.5% R-sq(adj) = 94.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.102729E+13	3.051365E+13
Error	3	2.194839E+12	731613102080
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DaysAFO	1	5.716786E+13
DAFHP	1	3.859430E+12

The regression equation is

$$\text{TotalOE} = -146052 + 1980644 \text{ Avg-No} - 5971 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	-146052	1120702	-0.13
Avg-No	1980644	647870	3.06
DAFHP	-5971	4223	-1.41

s = 1238751 R-sq = 92.7% R-sq(adj) = 87.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.861862E+13	2.930931E+13
Error	3	4.603516E+12	1.534505E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
Avg-No	1	5.554988E+13
DAFHP	1	3.068729E+12

The regression equation is

$$\text{TotalOE} = -146052 - 5971 \text{ DAFHP} + 1980644 \text{ Avg-No}$$

Predictor	Coef	Stdev	t-ratio
Constant	-146052	1120702	-0.13
DAFHP	-5971	4223	-1.41
Avg-No	1980644	647870	3.06

s = 1238751 R-sq = 92.7% R-sq(adj) = 87.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	5.861862E+13	2.930931E+13
Error	3	4.603516E+12	1.534505E+12
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
Avg-No	1	1.434187E+13

The regression equation is

$$\text{TotalOE} = -2.19\text{E}+08 + 2647748 \text{ FY} - 3439 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	-218911040	26200352	-8.36
FY	2647748	317811	8.33
DAFHP	-3439	1281	-2.68

s = 511511 R-sq = 98.8% R-sq(adj) = 97.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.243720E+13	3.121859E+13
Error	3	784931422208	261643763712
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
FY	1	6.055100E+13
DAFHP	1	1.886191E+12

The regression equation is

$$\text{TotalOE} = -2.19\text{E}+08 - 3439 \text{ DAFHP} + 2647748 \text{ FY}$$

Predictor	Coef	Stdev	t-ratio
Constant	-218911040	26200352	-8.36
DAFHP	-3439	1281	-2.68
FY	2647748	317811	8.33

s = 511511 R-sq = 98.8% R-sq(adj) = 97.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	6.243720E+13	3.121859E+13
Error	3	784931422208	261643763712
Total	5	6.322212E+13	

SOURCE	DF	SEQ SS
DAFHP	1	4.427675E+13
FY	1	1.816045E+13

J. ANALYSIS OF OG-30 COSTS FOR THE 270 WMEC.

	OG30TOTL	DAFHP	DAYS U/W	MSNS	RES HRS	DAYS AFO	AVG NO	FY
DAFHP	0.879							
Days-U/W	0.993	0.922						
Missions	0.988	0.883	0.990					
Res-Hrs	0.994	0.907	0.999	0.995				
DaysAFO	0.977	0.956	0.994	0.975	0.990			
Avg-No	0.962	0.959	0.973	0.940	0.963	0.983		
FY	0.991	0.923	0.991	0.976	0.987	0.985	0.988	
Inv-Cost	0.871	0.819	0.849	0.820	0.840	0.850	0.922	0.906

The regression equation is

$$\text{OG30TOTL} = -641343 + 5103 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	-641343	1281611	-0.50
DAFHP	5103	1381	3.70

s = 1433055 R-sq = 77.3% R-sq(adj) = 71.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.804498E+13	2.804498E+13
Error	4	8.214588E+12	2.053647E+12
Total	5	3.625956E+13	

The regression equation is
 OG30TOTL = 202303 + 6448 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	202303	248830	0.81
Days-U/W	6448.1	385.6	16.72

s = 357522 R-sq = 98.6% R-sq(adj) = 98.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.574827E+13	3.574827E+13
Error	4	511287951360	127821938688
Total	5	3.625956E+13	

The regression equation is
 OG30TOTL = 487291 + 15972 Missions

Predictor	Coef	Stdev	t-ratio
Constant	487291	303608	1.61
Missions	15972	1235	12.93

s = 460089 R-sq = 97.7% R-sq(adj) = 97.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.541284E+13	3.541284E+13
Error	4	846726168576	211681542144
Total	5	3.625956E+13	

The regression equation is
 OG30TOTL = 387191 + 318 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	387191	226997	1.71
Res-Hrs	318.32	18.00	17.68

s = 338362 R-sq = 98.7% R-sq(adj) = 98.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.580161E+13	3.580161E+13
Error	4	457955475456	114488836096
Total	5	3.625956E+13	

The regression equation is
 OG30TOTL = 312991 + 4797 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	312991	445997	0.70
DaysAFO	4796.9	528.5	9.08

s = 647868 R-sq = 95.4% R-sq(adj) = 94.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.458063E+13	3.458063E+13
Error	4	1.678934E+12	419733438464
Total	5	3.625956E+13	

The regression equation is
 OG30TOTL = - 627013 + 856753 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	-627013	679840	-0.92
Avg-No	856753	120838	7.09

s = 817396 R-sq = 92.6% R-sq(adj) = 90.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.358701E+13	3.358701E+13
Error	4	2.672542E+12	668135587840
Total	5	3.625954E+13	

The regression equation is
 OG30TOTL = -1.18E+08 + 1427136 FY

Predictor	Coef	Stdev	t-ratio
Constant	-118447648	8028701	-14.75
FY	1427136	93884	15.20

s = 392746 R-sq = 98.3% R-sq(adj) = 97.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.564256E+13	3.564256E+13
Error	4	616997519360	154249330688
Total	5	3.625954E+13	

The regression equation is
 OG30TOTL = -45984032 + 0.0674 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-45984032	14016479	-3.28
Inv-Cost	0.06744	0.01906	3.54

s = 1481349 R-sq = 75.8% R-sq(adj) = 69.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.748197E+13	2.748197E+13
Error	4	8.777586E+12	2.194396E+12
Total	5	3.625954E+13	

The regression equation is
 OG30TOTL = -24842496 + 2933 DAFHP + 0.0354 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-24842496	21210320	-1.17
DAFHP	2933	2318	1.27
Inv-Cost	0.03537	0.03095	1.14

s = 1381145 R-sq = 84.2% R-sq(adj) = 73.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.053688E+13	1.526844E+13
Error	3	5.722685E+12	1.907561E+12
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
DAFHP	1	2.804498E+13
Inv-Cost	1	2.491902E+12

The regression equation is

$$\text{OG30TOTL} = -24842496 + 0.0354 \text{ Inv-Cost} + 2933 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	-24842496	21210320	-1.17
Inv-Cost	0.03537	0.03095	1.14
DAFHP	2933	2318	1.27

s = 1381145 R-sq = 84.2% R-sq(adj) = 73.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.053688E+13	1.526844E+13
Error	3	5.722685E+12	1.907561E+12
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
DAFHP	1	3.054899E+12

The regression equation is

$$\text{OG30TOTL} = -5166854 + 5900 \text{ Days-U/W} + 0.00770 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5166854	6290593	-0.82
Days-U/W	5900.4	755.3	7.81
Inv-Cost	0.007696	0.009009	0.85

s = 370249 R-sq = 98.9% R-sq(adj) = 98.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.584831E+13	1.792416E+13
Error	3	411254063104	137084665856
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Days-U/W	1	3.574827E+13
Inv-Cost	1	100033822720

The regression equation is

$$\text{OG30TOTL} = -5166854 + 0.00770 \text{ Inv-Cost} + 5900 \text{ Days-U/W}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5166854	6290593	-0.82
Inv-Cost	0.007696	0.009009	0.85
Days-U/W	5900.4	755.3	7.81

s = 370249 R-sq = 98.9% R-sq(adj) = 98.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.584831E+13	1.792416E+13
Error	3	411254063104	137084665856
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
Days-U/W	1	8.366331E+12

The regression equation is

$$\text{OG30TOTL} = -9528210 + 13531 \text{ Missions} + 0.0143 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-9528210	6064684	-1.57
Missions	13531	1801	7.51
Inv-Cost	0.014270	0.008634	1.65

s = 384341 R-sq = 98.8% R-sq(adj) = 98.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.581640E+13	1.790820E+13
Error	3	443153514496	147717816320
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Missions	1	3.541284E+13
Inv-Cost	1	403572654080

The regression equation is

$$\text{OG30TOTL} = -9528210 + 0.0143 \text{ Inv-Cost} + 13531 \text{ Missions}$$

Predictor	Coef	Stdev	t-ratio
Constant	-9528210	6064685	-1.57
Inv-Cost	0.014270	0.008634	1.65
Missions	13531	1801	7.51

s = 384341 R-sq = 98.8% R-sq(adj) = 98.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.581640E+13	1.790820E+13
Error	3	443153514496	147717816320
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
Missions	1	8.334431E+12

The regression equation is

$$\text{OG30TOTL} = -6241345 + 285 \text{ Res-Hrs} + 0.00947 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-6241345	5237603	-1.19
Res-Hrs	285.44	30.91	9.23
Inv-Cost	0.009468	0.007475	1.27

s = 315378 R-sq = 99.2% R-sq(adj) = 98.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.596117E+13	1.798058E+13
Error	3	298389340160	99463069696
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Res-Hrs	1	3.580161E+13
Inv-Cost	1	159566069760

The regression equation is

$$\text{OG30TOTL} = - 6241345 + 0.00947 \text{ Inv-Cost} + 285 \text{ Res-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	6241345	5237603	-1.19
Inv-Cost	0.009468	0.007475	1.27
Res-Hrs	285.44	30.91	9.23

s = 315378 R-sq = 99.2% R-sq(adj) = 98.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.596117E+13	1.798058E+13
Error	3	298389340160	99463069696
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
Res-Hrs	1	8.479196E+12

The regression equation is

$$\text{OG30TOTL} = - 7539548 + 4191 \text{ DaysAFO} + 0.0112 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-7539548	11944160	-0.63
DaysAFO	4191	1084	3.87
Inv-Cost	0.01125	0.01709	0.66

s = 699334 R-sq = 96.0% R-sq(adj) = 93.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.479236E+13	1.739618E+13
Error	3	1.467203E+12	489067708416
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
DaysAFO	1	3.458063E+13
Inv-Cost	1	211730694144

The regression equation is

$$\text{OG30TOTL} = -7539548 + 0.0112 \text{ Inv-Cost} + 4191 \text{ DaysAFO}$$

Predictor	Coef	Stdev	t-ratio
Constant	-7539548	11944160	-0.63
Inv-Cost	0.01125	0.01709	0.66
DaysAFO	4191	1084	3.87

s = 699334 R-sq = 96.0% R-sq(adj) = 93.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.479236E+13	1.739618E+13
Error	3	1.467203E+12	489067708416
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
DaysAFO	1	7.310381E+12

The regression equation is

$$\text{OG30TOTL} = 5445414 + 951008 \text{ Avg-No} - 0.0089 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	5445414	21188400	0.26
Avg-No	951008	356325	2.67
Inv-Cost	-0.00889	0.03101	-0.29

s = 931170 R-sq = 92.8% R-sq(adj) = 88.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.365833E+13	1.682917E+13
Error	3	2.601230E+12	867076538368
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Avg-No	1	3.358701E+13
Inv-Cost	1	71312474112

The regression equation is

$$\text{OG30TOTL} = -1.27\text{E}+08 + 1632677 \text{ FY} - 0.0122 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-127054160	11567512	-10.98
FY	1632677	220782	7.39
Inv-Cost	-0.01220	0.01188	-1.03

s = 390080 R-sq = 98.7% R-sq(adj) = 97.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.580308E+13	1.790154E+13
Error	3	456486944768	152162271232
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
FY	1	3.564256E+13
Inv-Cost	1	160510509056

The regression equation is

$$\text{OG30TOTL} = -1.27\text{E}+08 - 0.0122 \text{ Inv-Cost} + 1632677 \text{ FY}$$

Predictor	Coef	Stdev	t-ratio
Constant	-127054160	11567512	-10.98
Inv-Cost	-0.01220	0.01188	-1.03
FY	1632677	220782	7.39

s = 390080 R-sq = 98.7% R-sq(adj) = 97.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	3.580308E+13	1.790154E+13
Error	3	456486944768	152162271232
Total	5	3.625956E+13	

SOURCE	DF	SEQ SS
Inv-Cost	1	2.748197E+13
FY	1	8.321099E+12

K. ANALYSIS OF OG-42 COSTS FOR THE 270 WMEC.

	OG42	DAFHP	DAYS U/W	MSNS	RES HRS	DAYS AFO	AVG NO	FY
DAFHP	0.241							
Days-U/W	0.518	0.922						
Missions	0.610	0.883	0.990					
Res-Hrs	0.545	0.907	0.999	0.995				
DaysAFO	0.440	0.956	0.994	0.975	0.990			
Avg-No	0.425	0.959	0.973	0.940	0.963	0.983		
FY	0.540	0.923	0.991	0.976	0.987	0.985	0.988	
Inv-Cost	0.526	0.819	0.849	0.820	0.840	0.850	0.922	0.906

The regression equation is
 OG42 = 103931 + 149 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	103931	278833	0.37
DAFHP	148.9	300.4	0.50

s = 311782 R-sq = 5.8% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	23889977344	23889977344
Error	4	388831379456	97207844864
Total	5	412721348608	

The regression equation is
 OG42 = 39402 + 359 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	39402	191255	0.21
Days-U/W	358.8	296.4	1.21

s = 274797 R-sq = 26.8% R-sq(adj) = 8.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	110667628544	110667628544
Error	4	302053654528	75513397248
Total	5	412721283072	

The regression equation is
 OG42 = 23856 + 1051 Missions

Predictor	Coef	Stdev	t-ratio
Constant	23856	168017	0.14
Missions	1051.2	683.4	1.54

s = 254614 R-sq = 37.2% R-sq(adj) = 21.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	153408897024	153408897024
Error	4	259312386048	64828096512
Total	5	412721283072	

The regression equation is
 OG42 = 40585 + 18.6 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	40585	180703	0.22
Res-Hrs	18.62	14.33	1.30

s = 269355 R-sq = 29.7% R-sq(adj) = 12.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	122512146432	122512146432
Error	4	290209136640	72552284160
Total	5	412721283072	

The regression equation is
 OG42 = 70393 + 230 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	70393	198620	0.35
DaysAFO	230.4	235.4	0.98

s = 288521 R-sq = 19.3% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	79743549440	79743549440
Error	4	332977799168	83244417024
Total	5	412721348608	

The regression equation is
 OG42 = 29054 + 40367 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	29054	241828	0.12
Avg-No	40367	42983	0.94

s = 290758 R-sq = 18.1% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	74560503808	74560503808
Error	4	338160844800	84540194816
Total	5	412721348608	

The regression equation is
 OG42 = - 6867988 + 82981 FY

Predictor	Coef	Stdev	t-ratio
Constant	-6867988	5525315	-1.24
FY	82981	64611	1.28

s = 270286 R-sq = 29.2% R-sq(adj) = 11.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	120503336960	120503336960
Error	4	292217946112	73054486528
Total	5	412721283072	

The regression equation is
 OG42 = - 2970389 + 0.00435 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-2970389	2584018	-1.15
Inv-Cost	0.004351	0.003513	1.24

s = 273095 R-sq = 27.7% R-sq(adj) = 9.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	114397085696	114397085696
Error	4	298324197376	74581016576
Total	5	412721283072	

The regression equation is

$$OG42 = -447770 + 936 \text{ Missions} + 0.00067 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-447770	4631184	-0.10
Missions	936	1376	0.68
Inv-Cost	0.000672	0.006593	0.10

s = 293495 R-sq = 37.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	154303791104	77151862784
Error	3	258417491968	86139142144
Total	5	412721283072	

SOURCE	DF	SEQ SS
Missions	1	153408897024
Inv-Cost	1	894891520

The regression equation is

$$OG42 = -447770 + 0.00067 \text{ Inv-Cost} + 936 \text{ Missions}$$

Predictor	Coef	Stdev	t-ratio
Constant	-447770	4631184	-0.10
Inv-Cost	0.000672	0.006593	0.10
Missions	936	1376	0.68

s = 293495 R-sq = 37.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	154303791104	77151862784
Error	3	258417491968	86139142144
Total	5	412721283072	

SOURCE	DF	SEQ SS
Inv-Cost	1	114397085696
Missions	1	39906709504

The regression equation is

$$OG42 = -1312188 + 11.9 \text{ Res-Hrs} + 0.00193 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-1312188	5105825	-0.26
Res-Hrs	11.91	30.14	0.40
Inv-Cost	0.001932	0.007287	0.27

s = 307443 R-sq = 31.3% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	129158086656	64579043328
Error	3	283563196416	94521065472
Total	5	412721283072	

SOURCE	DF	SEQ SS
Res-Hrs	1	122512146432
Inv-Cost	1	6645919744

The regression equation is

$$OG42 = -1312188 + 0.00193 \text{ Inv-Cost} + 11.9 \text{ Res-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-1312188	5105825	-0.26
Inv-Cost	0.001932	0.007287	0.27
Res-Hrs	11.91	30.14	0.40

s = 307443 R-sq = 31.3% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	129158086656	64579043328
Error	3	283563196416	94521065472
Total	5	412721283072	

SOURCE	DF	SEQ SS
Inv-Cost	1	114397085696
Res-Hrs	1	14760972288

The regression equation is
 OG42 = - 5669102 + 54350 FY + 0.00170 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-5669102	9205604	-0.62
FY	54350	175702	0.31
Inv-Cost	0.001700	0.009455	0.18

s = 310432 R-sq = 30.0% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	123618000896	61809000448
Error	3	289103347712	96367738880
Total	5	412721348608	

SOURCE	DF	SEQ SS
FY	1	120503336960
Inv-Cost	1	3114625536

The regression equation is
 OG42 = - 5669102 + 0.00170 Inv-Cost + 54350 FY

Predictor	Coef	Stdev	t-ratio
Constant	-5669102	9205604	-0.62
Inv-Cost	0.001700	0.009455	0.18
FY	54350	175702	0.31

s = 310432 R-sq = 30.0% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	123618000896	61809000448
Error	3	289103347712	96367738880
Total	5	412721348608	

SOURCE	DF	SEQ SS
Inv-Cost	1	114397085696
FY	1	9220874240

The regression equation is
 OG42 = - 1753956 + 176 Days-U/W + 0.00257 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-1753956	5290583	-0.33
Days-U/W	175.8	635.2	0.28
Inv-Cost	0.002570	0.007577	0.34

s = 311391 R-sq = 29.5% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	121827753984	60913876992
Error	3	290893529088	96964509696
Total	5	412721283072	

SOURCE	DF	SEQ SS
Days-U/W	1	110667628544
Inv-Cost	1	11160113152

The regression equation is
 OG42 = - 1753956 + 0.00257 Inv-Cost + 176 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	-1753956	5290583	-0.33
Inv-Cost	0.002570	0.007577	0.34
Days-U/W	175.8	635.2	0.28

s = 311391 R-sq = 29.5% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	121827753984	60913876992
Error	3	290893529088	96964509696
Total	5	412721283072	

SOURCE	DF	SEQ SS
Inv-Cost	1	114397085696
Days-U/W	1	7430635520

The regression equation is
 OG42 = - 5548586 + 0.00826 Inv-Cost - 358 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-5548586	4458776	-1.24
Inv-Cost	0.008261	0.006505	1.27
DAFHP	-357.7	487.3	-0.73

s = 290340 R-sq = 38.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	159828541440	79914270720
Error	3	252892807168	84297580544
Total	5	412721348608	

SOURCE	DF	SEQ SS
Inv-Cost	1	114397085696
DAFHP	1	45431406592

The regression equation is
 OG42 = - 5548586 - 358 DAFHP + 0.00826 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-5548586	4458776	-1.24
DAFHP	-357.7	487.3	-0.73
Inv-Cost	0.008261	0.006505	1.27

s = 290340 R-sq = 38.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	159828541440	79914270720
Error	3	252892807168	84297580544
Total	5	412721348608	

SOURCE	DF	SEQ SS
DAFHP	1	23889977344
Inv-Cost	1	135938506752

L. ANALYSIS OF OG-45 COSTS FOR THE 270 WMEC.

	OG45	DAFHP	DAYS U/W	MSNS	RES HRS	DAYS AFO	AVG NO	FY
DAFHP	0.768							
Days-U/W	0.923	0.922						
Missions	0.952	0.883	0.990					
Res-Hrs	0.934	0.907	0.999	0.995				
DaysAFO	0.892	0.956	0.994	0.975	0.990			
Avg-No	0.884	0.959	0.973	0.940	0.963	0.983		
FY	0.935	0.923	0.991	0.976	0.987	0.985	0.988	
Inv-Cost	0.874	0.819	0.849	0.820	0.840	0.850	0.922	0.906

The regression equation is
 OG45 = - 126189 + 1160 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-126189	448421	-0.28
DAFHP	1159.8	483.1	2.40

s = 501409 R-sq = 59.0% R-sq(adj) = 48.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.449045E+12	1.449045E+12
Error	4	1.005644E+12	251410841600
Total	5	2.454688E+12	

The regression equation is
 OG45 = 16379 + 1560 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	16379	209595	0.08
Days-U/W	1559.8	324.8	4.80

s = 301149 R-sq = 85.2% R-sq(adj) = 81.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.091927E+12	2.091927E+12
Error	4	362762207232	90690551808
Total	5	2.454689E+12	

The regression equation is
 OG45 = 58290 + 4004 Missions

Predictor	Coef	Stdev	t-ratio
Constant	58290	158090	0.37
Missions	4003.6	643.0	6.23

s = 239570 R-sq = 90.6% R-sq(adj) = 88.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.225114E+12	2.225114E+12
Error	4	229574574080	57393643520
Total	5	2.454688E+12	

The regression equation is
 OG45 = 52707 + 77.8 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	52707	187883	0.28
Res-Hrs	77.84	14.90	5.22

s = 280058 R-sq = 87.2% R-sq(adj) = 84.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.140959E+12	2.140959E+12
Error	4	313729482752	78432370688
Total	5	2.454688E+12	

The regression equation is
 OG45 = 52707 + 77.8 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	52707	187883	0.28
Res-Hrs	77.84	14.90	5.22

s = 280058 R-sq = 87.2% R-sq(adj) = 84.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.140959E+12	2.140959E+12
Error	4	313729482752	78432370688
Total	5	2.454688E+12	

The regression equation is
 OG45 = 56739 + 1140 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	56739	243441	0.23
DaysAFO	1140.4	288.5	3.95

s = 353630 R-sq = 79.6% R-sq(adj) = 74.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.954472E+12	1.954472E+12
Error	4	500216823808	125054156800
Total	5	2.454688E+12	

The regression equation is
 OG45 = - 171733 + 204702 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	-171733	304832	-0.56
Avg-No	204702	54182	3.78

s = 366511 R-sq = 78.1% R-sq(adj) = 72.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.917368E+12	1.917368E+12
Error	4	537320554496	134330122240
Total	5	2.454688E+12	

The regression equation is
 OG45 = -29093792 + 350005 FY

Predictor	Coef	Stdev	t-ratio
Constant	-29093792	5698962	-5.11
FY	350005	66641	5.25

s = 278780 R-sq = 87.3% R-sq(adj) = 84.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.143815E+12	2.143815E+12
Error	4	310874013696	77718487040
Total	5	2.454688E+12	

The regression equation is
 OG45 = -12119396 + 0.0176 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-12119396	3595939	-3.37
Inv-Cost	0.017623	0.004889	3.60

s = 380041 R-sq = 76.5% R-sq(adj) = 70.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.876963E+12	1.876963E+12
Error	4	577726054400	144431513600
Total	5	2.454688E+12	

The regression equation is
 OG45 = - 3992603 + 3016 Missions + 0.00577 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-3992603	3684359	-1.08
Missions	3016	1094	2.76
Inv-Cost	0.005772	0.005245	1.10

s = 233491 R-sq = 93.3% R-sq(adj) = 88.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.291134E+12	1.145567E+12
Error	3	163554197504	54518063104
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Missions	1	2.225114E+12
Inv-Cost	1	66020388864

The regression equation is

$$OG45 = -3992603 + 0.00577 \text{ Inv-Cost} + 3016 \text{ Missions}$$

Predictor	Coef	Stdev	t-ratio
Constant	-3992603	3684359	-1.08
Inv-Cost	0.005772	0.005245	1.10
Missions	3016	1094	2.76

s = 233491 R-sq = 93.3% R-sq(adj) = 88.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.291134E+12	1.145567E+12
Error	3	163554197504	54518063104
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
Missions	1	414171791360

The regression equation is

$$OG45 = -26914624 + 297962 \text{ FY} + 0.00309 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-26914624	9386602	-2.87
FY	297962	179156	1.66
Inv-Cost	0.003090	0.009641	0.32

s = 316535 R-sq = 87.8% R-sq(adj) = 79.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.154105E+12	1.077053E+12
Error	3	300583616512	100194516992
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
FY	1	2.143815E+12
Inv-Cost	1	10290388992

The regression equation is

$$OG45 = -26914624 + 0.00309 \text{ Inv-Cost} + 297962 \text{ FY}$$

Predictor	Coef	Stdev	t-ratio
Constant	-26914624	9386602	-2.87
Inv-Cost	0.003090	0.009641	0.32
FY	297962	179156	1.66

s = 316535 R-sq = 87.8% R-sq(adj) = 79.6%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.154105E+12	1.077053E+12
Error	3	300583616512	100194516992
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
FY	1	277142372352

The regression equation is

$$OG45 = -4260515 + 56.4 \text{ Res-Hrs} + 0.00616 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-4260515	4757243	-0.90
Res-Hrs	56.44	28.08	2.01
Inv-Cost	0.006161	0.006789	0.91

s = 286453 R-sq = 90.0% R-sq(adj) = 83.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.208522E+12	1.104261E+12
Error	3	246166454272	82055462912
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Res-Hrs	1	2.140959E+12
Inv-Cost	1	67563028480

The regression equation is

$$OG45 = - 4260515 + 0.00616 \text{ Inv-Cost} + 56.4 \text{ Res-Hrs}$$

Predictor	Coef	Stdev	t-ratio
Constant	-4260515	4757243	-0.90
Inv-Cost	0.006161	0.006789	0.91
Res-Hrs	56.44	28.08	2.01

s = 286453 R-sq = 90.0% R-sq(adj) = 83.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.208522E+12	1.104261E+12
Error	3	246166454272	82055462912
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
Res-Hrs	1	331559534592

The regression equation is

$$OG45 = - 4553718 + 1094 \text{ Days-U/W} + 0.00655 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-4553718	5285070	-0.86
Days-U/W	1093.7	634.6	1.72
Inv-Cost	0.006550	0.007569	0.87

s = 311067 R-sq = 88.2% R-sq(adj) = 80.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.164401E+12	1.082201E+12
Error	3	290287648768	96762527744
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Days-U/W	1	2.091927E+12
Inv-Cost	1	72474558464

The regression equation is

$$OG45 = - 4553718 + 0.00655 \text{ Inv-Cost} + 1094 \text{ Days-U/W}$$

Predictor	Coef	Stdev	t-ratio
Constant	-4553718	5285070	-0.86
Inv-Cost	0.006550	0.007569	0.87
Days-U/W	1093.7	634.6	1.72

s = 311067 R-sq = 88.2% R-sq(adj) = 80.3%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.164401E+12	1.082201E+12
Error	3	290287648768	96762527744
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
Days-U/W	1	287438340096

The regression equation is

$$OG45 = - 5821764 + 686 \text{ DaysAFO} + 0.00842 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5821764	6091036	-0.96
DaysAFO	686.5	552.7	1.24
Inv-Cost	0.008419	0.008716	0.97

s = 356632 R-sq = 84.5% R-sq(adj) = 74.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.073130E+12	1.036565E+12
Error	3	381558784000	127186239488
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
DaysAFO	1	1.954472E+12
Inv-Cost	1	118658039808

The regression equation is

$$OG45 = - 5821764 + 0.00842 \text{ Inv-Cost} + 686 \text{ DaysAFO}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5821764	6091036	-0.96
Inv-Cost	0.008419	0.008716	0.97
DaysAFO	686.5	552.7	1.24

s = 356632 R-sq = 84.5% R-sq(adj) = 74.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	2.073130E+12	1.036565E+12
Error	3	381558784000	127186239488
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
DaysAFO	1	196167204864

The regression equation is

$$OG45 = - 5636118 + 119885 \text{ Avg-No} + 0.00800 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5636118	9097811	-0.62
Avg-No	119885	152998	0.78
Inv-Cost	0.00800	0.01331	0.60

s = 399823 R-sq = 80.5% R-sq(adj) = 67.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.975115E+12	987557265408
Error	3	479574294528	159858098176
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Avg-No	1	1.917368E+12
Inv-Cost	1	57746239488

The regression equation is

$$OG45 = -5636118 + 0.0080 \text{ Inv-Cost} + 119885 \text{ Avg-No}$$

Predictor	Coef	Stdev	t-ratio
Constant	-5636118	9097809	-0.62
Inv-Cost	0.00800	0.01331	0.60
Avg-No	119885	152998	0.78

s = 399823 R-sq = 80.5% R-sq(adj) = 67.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.975115E+12	987557265408
Error	3	479574294528	159858098176
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
Avg-No	1	98151694336

The regression equation is

$$OG45 = -10391394 + 240 \text{ DAFHP} + 0.0150 \text{ Inv-Cost}$$

Predictor	Coef	Stdev	t-ratio
Constant	-10391394	6619097	-1.57
DAFHP	239.8	723.4	0.33
Inv-Cost	0.015003	0.009657	1.55

s = 431013 R-sq = 77.3% R-sq(adj) = 62.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.897371E+12	948685504512
Error	3	557317488640	185772474368
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
DAFHP	1	1.449045E+12
Inv-Cost	1	448326074368

The regression equation is

$$\text{OG45} = -10391394 + 0.0150 \text{ Inv-Cost} + 240 \text{ DAFHP}$$

Predictor	Coef	Stdev	t-ratio
Constant	-10391394	6619097	-1.57
Inv-Cost	0.015003	0.009657	1.55
DAFHP	239.8	723.4	0.33

s = 431013 R-sq = 77.3% R-sq(adj) = 62.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	2	1.897371E+12	948685504512
Error	3	557317488640	185772474368
Total	5	2.454688E+12	

SOURCE	DF	SEQ SS
Inv-Cost	1	1.876963E+12
DAFHP	1	20408557568

M. ANALYSIS OF TOTAL OE COSTS FOR THE 110 WPB.

	TOTALOE	FY	DAFHP	DAYS U/W	RES HRS	DAYS AFO	AVG NO	MSNS
FY	0.927							
DAFHP	0.993	0.966						
DAYS-U/W	1.000	0.933	0.994					
RES-HRS	0.999	0.911	0.987	0.998				
DAYS-AFO	0.988	0.973	1.000	0.991	0.981			
AVG-NO	0.979	0.985	0.996	0.982	0.969	0.998		
MISSIONS	0.941	0.999	0.975	0.946	0.926	0.981	0.990	
INV-COST	0.927	1.000	0.966	0.933	0.911	0.973	0.985	0.999

The regression equation is

$$\text{TotalOE} = -1.07\text{E}+08 + 1247656 \text{ FY}$$

Predictor	Coef	Stdev	t-ratio
Constant	-106683184	43847072	-2.43
FY	1247656	503967	2.48

s = 712717 R-sq = 86.0% R-sq(adj) = 71.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.113290E+12	3.113290E+12
Error	1	507966062592	507966062592
Total	2	3.621256E+12	

The regression equation is
TotalOE = - 561725 + 1540 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-561725	326529	-1.72
DAFHP	1540.4	189.2	8.14

s = 231983 R-sq = 98.5% R-sq(adj) = 97.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.567440E+12	3.567440E+12
Error	1	53816225792	53816225792
Total	2	3.621256E+12	

The regression equation is
TotalOE = - 411996 + 1545 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	-411996	41869	-9.84
Days-U/W	1545.43	25.61	60.34

s = 31535 R-sq = 100.0% R-sq(adj) = 99.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.620262E+12	3.620262E+12
Error	1	994428928	994428928
Total	2	3.621256E+12	

The regression equation is
TotalOE = - 438030 + 94.8 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	-438030	106701	-4.11
Res-Hrs	94.824	3.969	23.89

s = 79578 R-sq = 99.8% R-sq(adj) = 99.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.614924E+12	3.614924E+12
Error	1	6332592128	6332592128
Total	2	3.621256E+12	

Unusual Observations

Obs.	Res-Hrs	TotalOE	Fit	Stdev.Fit	Residual	St.Resid
1	7972	324258	317908	79324	6349	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 TotalOE = - 140598 + 860 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	-140598	348705	-0.40
DaysAFO	860.1	131.6	6.54

s = 287831 R-sq = 97.7% R-sq(adj) = 95.4%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.538410E+12	3.538410E+12
Error	1	82846547968	82846547968
Total	2	3.621256E+12	

The regression equation is
 TotalOE = - 211308 + 176127 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	-211308	492261	-0.43
Avg-No	176127	37111	4.75

s = 392351 R-sq = 95.7% R-sq(adj) = 91.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.467317E+12	3.467317E+12
Error	1	153939279872	153939279872
Total	2	3.621255E+12	

The regression equation is
 TotalOE = 168719 + 1521 missions

Predictor	Coef	Stdev	t-ratio
Constant	168719	715579	0.24
missions	1521.2	548.5	2.77

s = 645485 R-sq = 88.5% R-sq(adj) = 77.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.204606E+12	3.204606E+12
Error	1	416650952704	416650952704
Total	2	3.621256E+12	

The regression equation is
 TotalOE = - 988905 + 0.0255 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-988905	1223214	-0.81
Inv-Cost	0.02546	0.01029	2.48

s = 712717 R-sq = 86.0% R-sq(adj) = 71.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	3.113290E+12	3.113290E+12
Error	1	507966062592	507966062592
Total	2	3.621256E+12	

N. ANALYSIS OF OG-30 COSTS FOR THE 110 WPB.

	OG30TOTL	FY	DAFHP	DAYS U/W	RES HRS	DAYS AFO	AVG NO	MSNS
FY	0.782							
DAFHP	0.917	0.966						
DAYS-U/W	0.954	0.933	0.994					
RES-HRS	0.970	0.911	0.987	0.998				
DAYS-AFO	0.905	0.973	1.000	0.991	0.981			
AVG-NO	0.880	0.985	0.996	0.982	0.969	0.998		
MISSIONS	0.805	0.999	0.975	0.946	0.926	0.981	0.990	
INV-COST	0.782	1.000	0.966	0.933	0.911	0.973	0.985	0.999

The regression equation is
 OG30TOTL = -70111440 + 823339 FY

Predictor	Coef	Stdev	t-ratio
Constant	-70111440	57003440	-1.23
FY	823339	655183	1.26

s = 926569 R-sq = 61.2% R-sq(adj) = 22.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.355775E+12	1.355775E+12
Error	1	858529857536	858529857536
Total	2	2.214304E+12	

The regression equation is
 OG30TOTL = - 232440 + 1113 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-232440	835801	-0.28
DAFHP	1112.8	484.3	2.30

s = 593796 R-sq = 84.1% R-sq(adj) = 68.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.861711E+12	1.861711E+12
Error	1	352593772544	352593772544
Total	2	2.214304E+12	

The regression equation is
 OG30TOTL = - 178007 + 1153 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	-178007	592975	-0.30
Days-U/W	1152.9	362.8	3.18

s = 446616 R-sq = 91.0% R-sq(adj) = 82.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.014840E+12	2.014840E+12
Error	1	199465828352	199465828352
Total	2	2.214305E+12	

The regression equation is
 OG30TOTL = - 227315 + 72.0 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	-227315	486731	-0.47
Res-Hrs	71.97	18.10	3.98

s = 363003 R-sq = 94.0% R-sq(adj) = 88.1%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	2.082534E+12	2.082534E+12
Error	1	131771006976	131771006976
Total	2	2.214304E+12	

Unusual Observations

Obs.	Res-Hrs	OG30TOTL	Fit	Stdev.Fit	Residual	St.Resid
1	7972	317485	346449	361845	-28964	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 OG30TOTL = 85228 + 616 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	85228	768031	0.11
DaysAFO	615.6	289.9	2.12

s = 633953 R-sq = 81.8% R-sq(adj) = 63.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.812408E+12	1.812408E+12
Error	1	401896898560	401896898560
Total	2	2.214304E+12	

The regression equation is
 OG30TOTL = 61224 + 123793 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	61224	888402	0.07
Avg-No	123793	66976	1.85

s = 708090 R-sq = 77.4% R-sq(adj) = 54.7%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.712913E+12	1.712913E+12
Error	1	501392015360	501392015360
Total	2	2.214304E+12	

The regression equation is
 OG30TOTL = 384775 + 1019 missions

Predictor	Coef	Stdev	t-ratio
Constant	384775	977639	0.39
missions	1018.5	749.4	1.36

s = 881875 R-sq = 64.3% R-sq(adj) = 29.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.436602E+12	1.436602E+12
Error	1	777704112128	777704112128
Total	2	2.214305E+12	

The regression equation is
 OG30TOTL = - 362824 + 0.0168 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-362824	1590241	-0.23
Inv-Cost	0.01680	0.01337	1.26

s = 926569 R-sq = 61.2% R-sq(adj) = 22.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	1.355775E+12	1.355775E+12
Error	1	858529857536	858529857536
Total	2	2.214304E+12	

O. ANALYSIS OF OG-42 COSTS FOR THE 110 WPB.

	OG42	FY	DAFHP	DAYS U/W	RES HRS	DAYS AFO	AVG NO	MSNS
FY	0.127							
DAFHP	0.379	0.966						
DAYS-U/W	0.475	0.933	0.994					
RES-HRS	0.525	0.911	0.987	0.998				
DAYS-AFO	0.352	0.973	1.000	0.991	0.981			
AVG-NO	0.299	0.985	0.996	0.982	0.969	0.998		
MISSIONS	0.164	0.999	0.975	0.946	0.926	0.981	0.990	
INV-COST	0.127	1.000	0.966	0.933	0.911	0.973	0.985	0.999

The regression equation is
 OG42 = - 167289 + 2053 FY

Predictor	Coef	Stdev	t-ratio
Constant	-167289	1396792	-0.12
FY	2053	16054	0.13

s = 22704 R-sq = 1.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	8429618	8429618
Error	1	515485952	515485952
Total	2	523915520	

The regression equation is
 $OG42 = 182 + 7.1 \text{ DAFHP}$

Predictor	Coef	Stdev	t-ratio
Constant	182	29812	0.01
DAFHP	7.08	17.27	0.41

s = 21180 R-sq = 14.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	75311824	75311824
Error	1	448603904	448603904
Total	2	523915520	

The regression equation is
 $OG42 = -1666 + 8.8 \text{ Days-U/W}$

Predictor	Coef	Stdev	t-ratio
Constant	-1666	26749	-0.06
Days-U/W	8.82	16.36	0.54

s = 20147 R-sq = 22.5% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	118008096	118008096
Error	1	405907456	405907456
Total	2	523915520	

The regression equation is
 $OG42 = -3225 + 0.600 \text{ Res-Hrs}$

Predictor	Coef	Stdev	t-ratio
Constant	-3225	26118	-0.12
Res-Hrs	0.5995	0.9715	0.62

s = 19479 R-sq = 27.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	144494800	144494800
Error	1	379420928	379420928
Total	2	523915520	

Unusual Observations

Obs.	Res-Hrs	OG42	Fit	Stdev.Fit	Residual	St.Resid
1	7972	0	1554	19417	-1554	-1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 OG42 = 2751 + 3.68 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	2751	25960	0.11
DaysAFO	3.679	9.798	0.38

s = 21428 R-sq = 12.4% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	64754592	64754592
Error	1	459161088	459161088
Total	2	523915520	

The regression equation is
 OG42 = 3704 + 647 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	3704	27406	0.14
Avg-No	647	2066	0.31

s = 21844 R-sq = 8.9% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	46768384	46768384
Error	1	477147136	477147136
Total	2	523915520	

The regression equation is
 OG42 = 7764 + 3.2 missions

Predictor	Coef	Stdev	t-ratio
Constant	7764	25030	0.31
missions	3.20	19.19	0.17

s = 22578 R-sq = 2.7% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	14136587	14136587
Error	1	509778944	509778944
Total	2	523915520	

The regression equation is
 OG42 = 6629 + 0.000042 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	6629	38967	0.17
Inv-Cost	0.0000419	0.0003276	0.13

s = 22704 R-sq = 1.6% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	8429618	8429618
Error	1	515485952	515485952
Total	2	523915520	

P. ANALYSIS OF OG-45 COSTS FOR THE 110 WPB.

	OG45	FY	DAFHP	DAYS U/W	RES HRS	DAYS AFO	AVG NO	MSNS
FY	0.930							
DAFHP	0.803	0.966						
DAYS-U/W	0.735	0.933	0.994					
RES-HRS	0.695	0.911	0.987	0.998				
DAYS-AFO	0.820	0.973	1.000	0.991	0.981			
AVG-NO	0.851	0.985	0.996	0.982	0.969	0.998		
MISSIONS	0.915	0.999	0.975	0.946	0.926	0.981	0.990	
INV-COST	0.930	1.000	0.966	0.933	0.911	0.973	0.985	0.999

The regression equation is
 OG45 = -36404448 + 422263 FY

Predictor	Coef	Stdev	t-ratio
Constant	-36404448	14553148	-2.50
FY	422263	167270	2.52

s = 236556 R-sq = 86.4% R-sq(adj) = 72.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	356612898816	356612898816
Error	1	55958642688	55958642688
Total	2	412571533312	

The regression equation is
 OG45 = - 329466 + 421 DAFHP

Predictor	Coef	Stdev	t-ratio
Constant	-329466	539084	-0.61
DAFHP	420.5	312.4	1.35

s = 382993 R-sq = 64.4% R-sq(adj) = 28.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	265887809536	265887809536
Error	1	146683723776	146683723776
Total	2	412571533312	

The regression equation is
 OG45 = - 232323 + 384 Days-U/W

Predictor	Coef	Stdev	t-ratio
Constant	-232323	577856	-0.40
Days-U/W	383.7	353.5	1.09

s = 435229 R-sq = 54.1% R-sq(adj) = 8.2%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	223147589632	223147589632
Error	1	189423878144	189423878144
Total	2	412571467776	

The regression equation is
 OG45 = - 207490 + 22.3 Res-Hrs

Predictor	Coef	Stdev	t-ratio
Constant	-207490	619550	-0.33
Res-Hrs	22.25	23.04	0.97

s = 462059 R-sq = 48.3% R-sq(adj) = 0.0%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	199072874496	199072874496
Error	1	213498593280	213498593280
Total	2	412571467776	

Unusual Observations

Obs.	Res-Hrs	OG45	Fit	Stdev.Fit	Residual	St.Resid
1	7972	6773	-30094	460586	36867	1.00 X

X denotes an obs. whose X value gives it large influence.

The regression equation is
 OG45 = - 228578 + 241 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	-228578	445285	-0.51
DaysAFO	240.9	168.1	1.43

s = 367551 R-sq = 67.3% R-sq(adj) = 34.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	277478113280	277478113280
Error	1	135093420032	135093420032
Total	2	412571533312	

The regression equation is
 OG45 = - 228578 + 241 DaysAFO

Predictor	Coef	Stdev	t-ratio
Constant	-228578	445285	-0.51
DaysAFO	240.9	168.1	1.43

s = 367551 R-sq = 67.3% R-sq(adj) = 34.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	277478113280	277478113280
Error	1	135093420032	135093420032
Total	2	412571533312	

The regression equation is
 OG45 = - 276236 + 51687 Avg-No

Predictor	Coef	Stdev	t-ratio
Constant	-276236	423547	-0.65
Avg-No	51687	31931	1.62

s = 337583 R-sq = 72.4% R-sq(adj) = 44.8%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	298609147904	298609147904
Error	1	113962319872	113962319872
Total	2	412571467776	

The regression equation is
 OG45 = - 223820 + 500 missions

Predictor	Coef	Stdev	t-ratio
Constant	-223820	287090	-0.78
missions	499.5	220.1	2.27

s = 258968 R-sq = 83.7% R-sq(adj) = 67.5%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	345506840576	345506840576
Error	1	67064709120	67064709120
Total	2	412571533312	

The regression equation is
 OG45 = - 632711 + 0.00862 Inv-Cost

Predictor	Coef	Stdev	t-ratio
Constant	-632711	405993	-1.56
Inv-Cost	0.008618	0.003414	2.52

s = 236556 R-sq = 86.4% R-sq(adj) = 72.9%

Analysis of Variance

SOURCE	DF	SS	MS
Regression	1	356612898816	356612898816
Error	1	55958642688	55958642688
Total	2	412571533312	

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